

UNIVERSITY OF HAWAII
Bulletin / General Information and Catalog

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28 29 30 31	25 <div>26</div> 27 28 29 30 31	

- Academic dates of significance.
 □ Holidays and Recesses.

UNIVERSITY CALENDAR 1969-1970

1969 First Semester

September 2-6, Tuesday-Saturday.....	Academic advising, registration, orientation
September 8, Monday.....	Instruction begins
September 16, Tuesday	Last day for registration for credit
October 24, Friday	Deficiency reports due
November 1, Saturday.....	Deadline for foreign undergraduate applications for 2nd semester
November 10, Monday	Veterans' Day (holiday) *
November 18, Tuesday	Last day for withdrawal from courses
November 26, Wednesday	Last day for removal of "Incompletes"
November 27, Thursday	Thanksgiving Day (holiday)
December 1, Monday.....	Deadline for U.S. undergraduate applications for 2nd semester
December 16, Tuesday.....	Last day of instruction
December 17, Wednesday.....	Final examinations begin
December 23, Tuesday.....	First semester ends

1970 Interim Period

January 5-17, Monday-Saturday.....	Student symposia; independent study; special projects; research; field trips; conferences, forums; community work; non-credit instruction, etc.
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March 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	April 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	May 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
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June 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	July 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	August 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

1970 Second Semester

January 19-24, Monday-Saturday.....	Academic advising, registration
January 26, Monday.....	Instruction begins
February 3, Tuesday.....	Last day for registration for credit
February 23, Monday.....	Presidents' Day (holiday)†
March 13, Friday.....	Deficiency reports due
March 26, Thursday.....	Prince Kuhio Day (holiday)
March 27-April 4, Friday-Saturday.....	Spring recess
April 1, Wednesday.....	Deadline for foreign undergraduate applications for summer session
April 3, Friday.....	Last day for removal of "Incompletes"
April 16, Thursday.....	Last day for withdrawal from courses
May 14, Thursday.....	Last day of instruction
May 15, Friday.....	Final examinations begin
May 21, Thursday.....	Second semester ends
May 31, Sunday.....	Commencement
June 1, Monday.....	Deadline for foreign undergraduate applications for 1st semester 1970
July 1, Wednesday.....	Deadline for U.S. undergraduate applications for 1st semester 1970

1970 Summer Session

June 15.....	Registration for 1st term
July 24.....	1st term ends
July 27.....	Registration for 2nd term
September 4.....	2nd term ends

*Holiday falling on Tuesday but celebrated on Monday under state law.

†Holiday falling on Sunday but celebrated on Monday.

Course Numbers and Descriptions; Abbreviations Used

Effective in 1968, the University of Hawaii revamped its course numbering system. The system is applicable to all campuses of the University, including its community colleges. The 1968 catalog lists the old numbers of courses which were then changed.

1. UNDERGRADUATE COURSES.....1 through 499

A. Courses not applicable towards a bachelor's degree 1- 99

Offered by community colleges 1- 59

Offered by Manoa or Hilo campuses..... 60- 89

Offered by educational television 90- 99

B. Courses applicable towards a bachelor's degree 100-499†

Initial or introductory courses; normally

open to freshmen.....100-199

Second-year courses in a sequence or development

within a field of study.....200-299

Third-year courses in sequence, or first courses

in professional curricula normally taken

by juniors300-399*

Most advanced undergraduate courses.....400-499*

2. POST-BACCALAUREATE COURSES.....500 through 800†

A. Courses in continuing education *not* generally

applicable toward degrees.....500-599

B. Courses applicable toward advanced degrees.....600-800

Courses typically taken in first year of graduate

study, or first in sequence.....600-699

More advanced graduate courses.....700-799

Thesis research..... 800

*May be accepted by Graduate Division to fulfill graduate degree requirements.

†Courses with numbers ending in -97 or -98 are generally experimental courses which may or may not be continued in future years.

A large proportion of the courses listed in this catalog were renumbered in 1968. The catalog for that year shows old numbers as well as new.

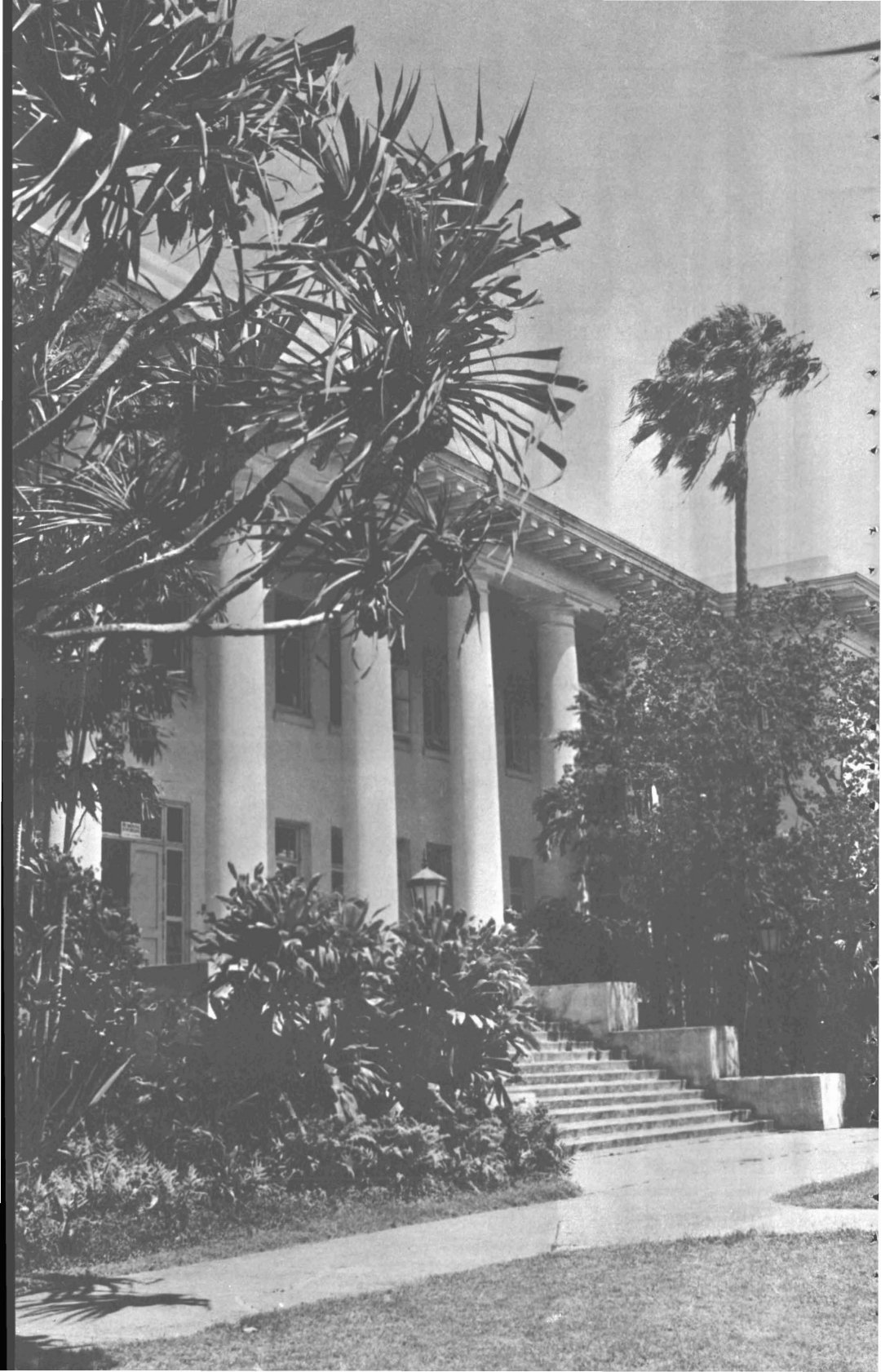
Courses are listed by college and department, arranged alphabetically, except for some interdisciplinary courses which are listed with the Selected Studies and Honors Program. Use the Table of Contents or Index to locate a given department or curriculum.

After each department and major division is its abbreviated IBM code (e.g., Anth for Anthropology). This code is also used in the *course schedules* issued prior to each semester and the summer session, showing the time and place of each class meeting.

Heading each course description are the number and title of the course, the number of credits, and the semester given. Thus (3) I signifies a 3-credit course offered the first semester; (4) II, a course carrying 4 credits offered the second semester; (3) I, II, a 3-credit course repeated in the second semester; (5-5) Yr., a year's sequence carrying 5 credits each semester; while (arr.) shows that the number of credits may vary, being arranged by the instructor in each instance.

Other abbreviations used in course descriptions are: Hr, hour; L, lecture(s); Lb, laboratory; L-Lb, combined lecture and laboratory; Alt. yrs., alternate years; Pre, prerequisite.

Alongside the title of each course is printed the name of the faculty member giving it, as best ascertained at the time this catalog was prepared in early spring of 1969. Rank, title and academic degrees of all faculty are given at the end of the catalog.



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General Information

THE UNIVERSITY OF HAWAII, the state-supported system of public higher education in Hawaii, conducts diverse programs in education, research and service for the state, the nation and the world community. It operates teaching and research facilities at more than 50 locations throughout the Hawaiian Islands and participates in international service and research activities in the Pacific Basin and Asian countries.

Throughout its history, a distinctive geographical and cultural setting has helped the University achieve excellence in certain areas of study. Geographical location has led to concentration in oceanography, marine biology and interdisciplinary studies of tropical environments, problems and resources. The physical characteristics of Hawaii have focused interest on natural phenomena in geophysics such as tsunami research, volcanology, astronomy and astrophysics. Hawaii's multi-racial culture and its ties with Asia have created a favorable environment for the study of various aspects of diverse cultural systems, including such subjects as linguistics, genetics, philosophy and inter-race relations.

The University offers course work leading to the bachelor's degree in 64 fields. The Graduate Division offers work leading toward the master's degree in 69 fields and the doctorate in 28.

In addition to its instructional program, the University conducts organized research in several fields. Special units initiate and conduct research in economics, education, biomedicine, Pacific and Asian linguistics, social sciences, water resources, marine biology, geosciences, astronomy, genetics and agriculture.

The main campus is located in the Manoa Valley section of Honolulu, the capital of the state. The University maintains a second campus at Hilo and there are three community college campuses on Oahu, one on Maui, and another on Kauai.

Space observatories and associated research facilities of the University are located on the islands of Maui and Hawaii. The Hawaii Institute of Marine Biology, operated by the University, is located on Coconut Island in Windward Oahu. The University conducts the largest Peace Corps training program in the nation and its facilities are located on the islands of Hawaii and Molokai. Branches of the Hawaii Agricultural Experiment Station are located on five of the major islands of the state.

History. The University of Hawaii was founded in 1907 as a federal land-grant institution specializing in agriculture and the mechanic arts. Referred to as the College of Hawaii, it was launched with five regular students and 12 faculty members on a temporary campus in downtown Honolulu. In 1912 the campus was moved to its present location in Manoa where an initial ninety acres were set aside for buildings. With the addition of a College of Arts and Sciences in 1920, the institution became the University of Hawaii.

In the following two decades, the University began to develop a special interest in bridging the East and West. A period of physical and academic expansion followed World War II, and new responsibilities and opportunities for growth were presented to the University when Hawaii became a state in 1959.

In 1960 the federal government created the East-West Center on the Manoa campus. Officially called the Center for Cultural and Technical Interchange between East and West, it aims to promote mutual understanding among the nations of the world through its exchange and service programs.

The University accepted a new task in 1964 when the state legislature authorized it to operate a state-wide community college system. With four state-owned technical schools for a base, the system's fifth campus in Leeward Oahu opened in September, 1968. A college transfer program was initiated at the Maui campus in 1967. The community colleges ultimately will offer a variety of college transfer and general education curricula on all campuses.

Colleges and Schools. The academic work of the University is administered by the following units: the colleges of Arts and Sciences, Business Administration, Education, Engineering, Health Sciences and Social Welfare, and Tropical Agriculture and the Division of Continuing Education. Included in the College of Tropical Agriculture are the Cooperative Extension Service and the Hawaii Agricultural Experiment Station. The School of Tourist Industry Management is part of the College of Business Administration. Four professional schools are included in the College of Health Sciences and Social Welfare: School of Medicine, School of Nursing, School of Public Health and School of Social Work. The School of Library Studies is an additional professional school.

An Honors Program embraces all colleges. The Graduate Division assumes the major role in the organization and development of graduate programs.

Accreditation. The University is accredited by the Western Association of Schools and Colleges. Professional programs in the curriculum are individually accredited by appropriate agencies. Students may transfer credits to other American or foreign universities on the same basis as course credits are transferred by other accredited American universities.

Academic Year. The academic year is divided into two 17-week semesters, a 12-week summer session which offers two 6-week terms, and a 2-week interim period between semesters (*see* "University Calendar").

Administrative Organization. Governance of the University of Hawaii is vested in a board of regents appointed by the governor of the state.

The president of the University serves as executive officer of the board of regents and as such is responsible for educational leadership and is the administrative head of the University. He is assisted by five vice-presidents in the areas of academic affairs, business affairs, community colleges, continuing education and community service, and student affairs. The president's staff also includes the secretary of the University, assistants to the president, and the director of University relations and development.

The council of deans advises the vice-president for academic affairs on matters of academic policy. The faculty senate is similarly advisory to the president and the board of regents.

Colors, Seal and Motto. The University of Hawaii colors are green and white. The rainbow, a frequent sight in Manoa Valley, is the campus symbol, and the University teams traditionally are nicknamed "The Rainbows." The University seal contains a torch and book titled *Malamalama* (The Light of Knowledge) in the center of a circular map of the Pacific, surrounded by the state motto, *Ua Mau Ke Ea o Ka Aina i Ka Pono* (The Life of the Land Is Preserved in Righteousness). The University motto, inscribed in both the Hawaiian and English languages on Founders' Gate at the entrance to the Manoa campus on University Avenue, is "Above all nations is humanity."

Inquiries. Prospective students should address inquiries to the following offices. *Undergraduates:* Office of Admissions and Records, Bachman Hall 125, 2444 Dole Street, Honolulu, Hawaii 96822. *Graduate students:* Graduate Division Office, 2540 Maile Way, Honolulu, Hawaii 96822. *General studies:* Division of Continuing Education, 2500 Dole Street, Honolulu, Hawaii 96822. *Summer session:* Dean of Summer Session, Room 101, 2500 Dole Street, Honolulu, Hawaii 96822. *Hilo campus:* Provost, Hilo Campus, University of Hawaii, Hilo, Hawaii 96720. *Community colleges:* Registrar, Honolulu Community College, 874 Dillingham Boulevard, Honolulu, Hawaii 96817; Registrar, Kapiolani Community College, 620 Pensacola Street, Honolulu, Hawaii 96814; Registrar, Leeward Oahu Community College, 96-050 Farrington Highway, Pearl City, Hawaii 96782; Registrar, Kauai Community College, RR 1, Box 216, Lihue, Kauai, Hawaii 96766; Maui Community College, 310 Kaahumanu Avenue, Kahului, Maui, Hawaii 96732.

RESEARCH AND SERVICE OPERATIONS

In addition to the instructional program, the University conducts organized research in several fields and offers other forms of public service. The most important of these operations are described below. The Co-operative Extension Service and the Hawaii Agricultural Experiment Station are discussed under the College of Tropical Agriculture. The Center for Engineering Research is discussed under the College of Engineering.

The primary function of the Economic Research Center is to promote an understanding of the economy of the state of Hawaii. The center evaluates economic effects of legislation and performs basic and applied economic research relating to Hawaii. In cooperation with the resident academic departments of the University, the center offers research training to advanced students.

The Education Research and Development Center adopts an interdisciplinary behavioral science approach to the conduct of basic and applied research, evaluation and development concerned with instructional and administrative problems. Activities are directed at obtaining factual evidence that may assist educators in reaching decisions about educational practices. Major programs focus upon understanding of achievement motivation, of conditions influencing educational attainment of different ethnic and socio-economic groups, and of means of optimizing the cognitive learning of school children. Research and development to facilitate educational planning and practice in Hawaii and the Pacific Basin is a primary concern.

The division of Educational Television Broadcasting Service serves as the production and transmission agency for the Hawaii Educational Television Network, a cooperative service of the University and the State Department of Education. The ETV studios located on campus also serve as laboratories for students enrolled in speech and education communications courses and as a production center for closed-circuit television courses within the University.

The Thomas Hale Hamilton Library, located on the Mall, houses the main book and periodical collections of the University of Hawaii Library. Completed in mid-1968, its four stories provide space for approximately 800,000 volumes and 955 readers. It houses all research collections except the Government Documents Collection and the Hawaiian and Pacific Collection, which will remain in Sinclair Library until phase II of the Hamilton Library is completed. Collections are arranged in openstack fashion for maximum ease of access. They number approximately 554,000 volumes.

Gregg M. Sinclair Library, located at University Avenue and Campus Road, houses the Undergraduate Collection (60,000 volumes) in addition to its two research collections noted above and the East-West Center Library's Oriental Collection. Sinclair Library is in process of being converted to an undergraduate library. This includes expansion of the seating capacity, development of book collections related to the undergraduate curriculum, and creation of browsing and listening areas.

The **University Instructional Resources Service Center** is staffed by instructional and media specialists. Upon request they offer assistance to faculty in the examination of instructional objectives, overall strategy planning, organization of instructional media, development of evaluating systems, and the necessary follow-up for effective development and implementation of programs.

The selection, location, production, evaluation and effective use of media is coordinated for faculty and staff by the Center which has three major sections. *Instructional Systems* operates the closed circuit television system, eleven multi-media auditoria and Varsity Theatre. *Graphics* prepares and develops a wide range of graphic materials including charts and transparencies. The *Media Lab* is used for demonstrations and media workshops.

Audiovisual Services in Kuykendall 106 lends AV equipment, films, and does tape duplications.

The **Harold L. Lyon Arboretum** occupies 123 acres in upper Manoa Valley, about 4 miles from the Manoa campus. It was developed by the Hawaiian Sugar Planters' Association and presented to the University in 1957. Several hundred species of exotic trees and shrubs are established, inventoried and well maintained, providing the University and the scientific community with an unrivaled facility for research on living tropical and subtropical plants.

The **Hawaii Cooperative Fishery Unit** promotes graduate training and research in fishery biology by providing students with support, counseling and facilities. The unit is headquartered in Edmondson Hall and functions academically as part of the department of zoology. Research program centers on the fishery biology and ecology of inshore marine and inland waters. The unit operates under joint sponsorship of the University, the Hawaii Department of Land and Natural Resources—Division of Fish and Game, and the U.S. Bureau of Sport Fisheries and Wildlife—Division of Fishery Services.

The **Hawaii Institute of Geophysics** was organized to take advantage of the unique position of Hawaii as a national laboratory for conducting geophysical research in the broad field of the earth sciences. In cooperation with academic departments devoted to the physical sciences, the institute conducts research programs and provides advanced training in

GENERAL INFORMATION

geodesy, aeronomy, meteorology, oceanography, solid earth geophysics, geology, soils and geochemistry. The main laboratory of the institute is located at 2525 Correa Road on the campus. The institute also maintains a cloud physics observatory at Hilo, Hawaii, a ship operations facility at Pier 18, Honolulu, and a seismographic observatory in upper Manoa Valley.

The **Hawaii Institute of Marine Biology**, established in 1950, with facilities on Coconut Island in Kaneohe Bay and at Kewalo Basin, encourages research in the marine biological sciences, including fisheries, by providing facilities and services for faculty members, graduate students and visiting scientists. Its research programs include studies in the ecology, physiology, behavior and systematics of marine animals and plants, pollution studies, biology, chemistry and pharmacology of toxic marine organisms, fundamental research in the interrelationship of organisms and their environment, and an applied resource development and exploitation research under the Sea Grant Program.

The **Industrial Relations Center**, established in 1948, seeks to promote understanding of labor-management relations problems, techniques and policies. It serves labor, management and the community by providing information on personnel and industrial relations. The center maintains a library containing the basic information services, as well as current publications; provides reference service; and assists in conducting conferences, lectures and group discussions, and in training of advanced students. Research studies in basic industrial relations problems are published by the center, as well as a monthly *Newsletter*, a bimonthly *Selected Acquisitions List*, reprints, reading materials and bibliographies.

The **Labor-Management Education Program**, instituted in 1965, is under the general supervision of the Industrial Relations Center, College of Business Administration. Its objectives are to provide basic leadership training for those associated with management and labor, to promote (1) understanding by both groups of the fundamental problems of mutual interest with which they deal; (2) knowledge of the factors which are essential to productive relations between them; and (3) appreciation of the public's interest in the satisfactory solution of their common problems. In addition to its schedule of general courses, the program conducts special courses, one-day and week-end institutes, conferences and staff training programs.

The **Institute for Astronomy** was founded in July 1967, to assume responsibility for the development of the University's research programs in astronomy. In cooperation with the department of physics and astronomy, with whom certain of its staff share appointments, the institute provides graduate training on the Manoa campus and at its observing facilities. The institute maintains observatories on Mount Haleakala, Maui, for studies of the sun (especially the corona), the zodiacal light

and the airglow. On Mauna Kea, Hawaii, it has under construction an 88-inch reflecting telescope and a coudé spectrograph. This telescope is to be used for planetary and stellar studies. In its Manoa campus headquarters the institute has extensive facilities for data reduction and analysis and for instrument development.

The **Institutional Research Office** is responsible for conducting and coordinating research relating to the University of Hawaii. An advisory committee aids in selecting institutional studies which are necessary for the University to function effectively and to plan realistically for the future. The office also develops and analyzes data on students, faculty and academic programs.

The **Laboratory of Sensory Sciences** performs basic research on all the sensory capabilities of man and other animals. Vision, hearing, taste, smell and the senses of the body are studied as well as their associated nerve reactions. In the laboratory are included the scientists, students and equipment in the disciplines of biophysics, psychophysics, electrophysiology, neurology and behavior, all investigating in common, but from different viewpoints, the basic question of the nature of sensation. This interdisciplinary approach, plus the year-round availability of marine animals for study in Hawaii, makes the laboratory unique in the study of the sensory processes.

The **Land Study Bureau** is the center of land research both at the University and for the state of Hawaii. Through its interdisciplinary research program, the bureau assembles, coordinates and interprets data on the characteristics and utilization of land and develops additional information as needed to integrate economic and physical data to achieve the highest and best use of the lands of Hawaii. The bureau provides the governor, the legislature, state departments and other public agencies, and private organizations and individuals with data and impartial advice on land use. Recently, the bureau has taken on the new role of advising and participating in the technological and economic development of other areas throughout the Pacific.

The **Legislative Reference Bureau**, created by the legislature in 1943 to aid in legislative and governmental problems, is situated on the campus, where it maintains a reference library. It provides the legislature, governor, departments, institutions and agencies of the state with bill-drafting services, information and reports. During sessions of the legislature the bureau maintains an office at the state capitol.

The **Pacific and Asian Linguistics Institute** plans and conducts research in general linguistic theory and specific problems of lexicology, structural semantics and grammatical description. Through its **Pacific Lexicography Center**, the research institute collects and stores data on

the languages of the Pacific and adjacent areas, developing and utilizing computer techniques for storage and retrieval.

The **Pacific Biomedical Research Center** encourages investigations in the areas of subcellular biology, microbiology, cell structure and function, regulatory biology, genetics, behavioral sciences, epidemiology and other areas of medical research. Its building provides space; research equipment, such as electron microscopes; and research facilities, such as an animal colony, to faculty members, graduate students and visiting scientists. The center contains research laboratories for microbiology, physiology, biochemistry, biophysics, and psychology, in which it fosters and facilitates research projects of biomedical interest.

The **Pacific Urban Studies and Planning Program** is a multidisciplinary effort directed at developing (1) alternative approaches to solving pressing regional and urban problems and (2) individual and group capability to analyze complex community problems and formulate and evaluate major new policies. The program is located in the College of Arts and Sciences and is directed by the concerned academic departments and professional schools. The program sponsors and facilitates problem-oriented research on urban and planning problems, particularly those relevant to Hawaii, the Pacific Basin and Asia; assists participating academic departments and professional schools in offering graduate programs of studies with an emphasis on urban and regional problems and planning processes and participates in, coordinates with, and supports related University endeavors concerned with urban and regional development and planning problems.

The **Population Genetics Laboratory** was established in 1968 to conduct research in human genetics, especially on peoples of the Pacific Basin. Laboratory equipment includes a CDC 3100 computer used also by visiting investigators from other institutions.

The **Social Science Research Institute** facilitates the initiation of faculty research and develops and conducts programs primarily of an interdisciplinary nature in the social sciences and related fields. Particular emphasis is given to the study of modernization, socio-economic development and cultural change. The institute is developing new programs in survey research, contemporary Korea, and Hawaii's people. A long-term study of culture and mental health in Asia and the Pacific will provide an opportunity for Asian and American scholars to participate in cooperative research.

The **Speech and Hearing Clinic** is operated by the division of speech pathology and audiology of the School of Medicine. Diagnostic and therapeutic services in speech and hearing are provided for children, University students, and other adults by staff members and supervised student clinicians. A fee of \$5.00 per semester or part thereof is charged for non-University registrants.

The **Speech Communication Center** provides programs for students discovered to need special attention to improvement of their communication skills. The department of speech-communication conducts the evaluation program for the University. Students may be referred by their instructors for evaluation at any time. Persons whose skills are evaluated as below criterion are trained in the center until these skills are re-evaluated as at or above criterion (usually after fewer than twenty clock hours of training). Within the space available, the center accepts, on a fee basis, persons not enrolled in the University. The center also engages in basic and applied research and provides training of researchers in speech-communication.

The **Statistical and Computing Center** operates an IBM 7040-1401 system and an IBM 360/50 system, along with a supporting line of peripheral punched card equipment. It provides services with respect to statistical consultation, system design, data processing, computing, and educational and reference advice to all the divisions and departments of the University.

The **University of Hawaii Press** publishes scholarly books and monographs, particularly those dealing with Hawaii, the Pacific and the Orient; regional books; and three scholarly journals, *Pacific Science*, *Philosophy East and West* and *Oceanic Linguistics*.

The Press is a member of the Association of American University Presses and the American Book Publishers Council. It was established in 1947 as a division of the University operating with the guidance of an advisory committee of seven members, drawn from the administration and faculty and appointed by the president. Book manuscripts should be sent to the director, journal papers to the respective editors-in-chief.

The **Office of University Relations and Development** is responsible for the production of all official University publications, for publicity and public relations activities, and for the coordination of efforts to raise funds for the University from private sources.

The **Waikiki Aquarium** is a state-owned museum specializing in Hawaiian aquatic exhibits. It is located in Waikiki and is operated by the University of Hawaii as a place for the education, recreation and inspiration of Hawaii's residents and visitors.

The **Water Resources Research Center**, established in 1964, plans and conducts research of both basic and practical nature related to Hawaii's water resources, and provides for the training of engineers and scientists through such research. Research is interdisciplinary with a broad base of physical sciences, technology and social sciences. It involves hydrology and hydraulic engineering, geology, geophysics and geochemistry, sanitary engineering and public health, climatology and soil physics, agricultural engineering and forestry, and socio-economic and legal aspects. The cen-

ter promotes interdisciplinary programs in water resources research among various units of the University.

The **Youth Development Center**, operated by the School of Social Work, is involved in social welfare planning efforts, particularly in the fields of juvenile delinquency and youth development. It offers consultation and training to agency and interagency programs through workshops, seminars, special University courses and other projects.

INTERNATIONAL TRAINING

The office of the vice-president for continuing education and community service provides general administrative and program direction and guidance to the University's training centers; coordinates all business, administrative and training aspects of the University's contracts with the Peace Corps and the Agency for International Development; assists in devising and developing plans for new training programs; promotes and encourages the most effective use of the University's resources on international activities; provides on-campus assistance to foreign visitors as needed, particularly those engaged in related international programs.

The training centers of the University of Hawaii include two Peace Corps centers, one located on the island of Hawaii and the other on the island of Molokai, to prepare trainees for service in the following East Asian and Pacific countries: Fiji, Tonga, Western Samoa, Korea, Malaysia, Philippines and Thailand. The Asia Training Center, located on the island of Oahu, trains A.I.D. personnel for assignments in Vietnam, Laos and other countries of Southeast Asia.

COOPERATING INSTITUTIONS

Through cooperative agreements with institutions listed below, the University has increased its research facilities and expanded its services to the state. The Bishop Museum, the Pacific and Asian Affairs Council, and the Academy of Arts offer student membership rates.

The **Bernice P. Bishop Museum**, a world-famous storehouse of information, contains an outstanding reference library as well as important biological and anthropological collections relating to Hawaii and other Pacific islands. In addition, this institution holds the combined herbaria of the University and the museum, the most complete collection of Hawaiian plants in existence. The museum's research facilities are available to University students on a reciprocal basis.

The **Fruit Fly Laboratory** is maintained on the campus by the U. S. Department of Agriculture, Entomology Research Division, for the study of fruit fly pests. This division also cooperates with the University in the use of a multi-purpose radiation facility, installed on campus in 1965 to study the disinfestation of agricultural produce.

The **Hawaiian Sugar Planters' Association** provided the funds for a building on the campus to house the Agricultural Engineering Institute, with shop facilities for instruction and research.

The **Honolulu Academy of Arts** has important collections of both Occidental and Oriental art. Installations of the permanent collection are augmented by a diversified schedule of temporary exhibitions including historical and temporary material from world-wide sources and a research library for Academy members, scholars and students.

The **Pacific and Asian Affairs Council** sponsors lectures, seminars and meetings on international affairs, particularly on Asia and the Pacific. Its library offers research materials on world affairs.

The **Pineapple Research Institute of Hawaii**, supported by the pineapple industry, is affiliated with the University. Offices and laboratories are located on a 150-acre experimental farm near Wahiawa, Oahu.

The **Biological Laboratory, Honolulu**, of the U.S. Bureau of Commercial Fisheries is located adjacent to the campus. Several of its senior staff members hold appointments on the Affiliate Graduate Faculty. The laboratory's mission is to conduct research on the oceanography and the fishery resources of the central Pacific Ocean. Its library, a comprehensive collection of works in the marine sciences, is available for use by students and faculty of the University. Requests for information should be addressed to the Director, Bureau of Commercial Fisheries, P. O. Box 3830, Honolulu, Hawaii 96812.

The universities of **Michigan** and **Hawaii** jointly use astronomical observatory facilities on the summit of Haleakala, island of Maui.

The **U.S. Geological Survey Volcano Observatory**, located at Kilauea Crater on the island of Hawaii, conducts research relating to the Hawaiian volcanoes. Research facilities are made available on occasion to faculty and students of the University.



Student Affairs

STUDENT ACTIVITIES

THE UNIVERSITY OF HAWAII offers an almost unlimited variety of programs and activities in which students are encouraged to participate. These programs and activities are provided for the entire University community and are administered by students. Programs are available in cultural and social activities, public affairs, educational experimentation, community service, publications and radio, and recreation. The two major organizations which provide these programs and services are the Associated Students of the University of Hawaii (ASUH) and the Campus Center Board.

The ASUH through its elected officers serves as the administrative and legislative body for students in participating in the policy making councils of the University. Among the activities directly administered by ASUH are experimental courses, innovative, interdisciplinary programs, a series of major symposia on public affairs, and a wide variety of other programs and services. The Campus Center Board presents programs in the cultural, social, recreational, and public affairs areas.

Ka Leo o Hawaii, the campus newspaper, is entirely staffed by students and opportunities are available in news-editorial writing, advertising, and in the Board of Publications Press. The Board of Publications which serves as publisher for *Ka Leo* also publishes *Kapa*, a literary magazine.

Other programs and activities of general interest to students are theatrical productions, about 100 different scholastic, honorary, professional, religious, social, departmental, special interest and residence organizations; the University band and chorus, and sports, including intercollegiate athletics and intramurals.

Students interested in participating in any of these programs or who desire to find out what other organizations and programs are available should inquire at the Bureau of Student Activities on the second floor of Hemenway Hall. The Bureau of Student Activities is responsible for the coordination of programs and services.

Rights and Freedoms of Foreign Students

The University of Hawaii, like all state universities, embraces those aspects of academic freedom which guarantee the freedom to teach and the freedom to learn. Free inquiry and free expression for both students and faculty are indispensable and inseparable. Students, whether from the United States or from foreign countries, as members of the academic community are encouraged to develop a capacity for critical judgment and to engage in sustained and independent search for truth.

Students from foreign countries, as full participants in the educational process at the University of Hawaii, have the right to pursue formal knowledge, verbal or written, in whatever directions and with whatever legitimately appropriate associations as are necessary, without fear of reprisal.

For its part, the University of Hawaii guarantees all students the freedom of silence. No student is required to engage in research on any topic or to make statements of any kind, unless it is his wish to do so.

The University of Hawaii would be most concerned if any government placed its own nationals in jeopardy for engaging in normal academic studies on its campus; it urges other governments to accept the concepts of academic freedom prevalent here if they intend for their nationals to study at this institution.

Orientation for Freshmen and New Students

Entering freshmen and transfer students are expected to be on the campus for the orientation program, the dates of which are stated in the University calendar (p. 2). This program is conducted by the Bureau of Student Activities and sponsored by the Associated Students of the University of Hawaii. It tries to reach as many new students as possible to help them get acquainted with the University.

Intramural Athletics and Sports

ASUH members are admitted free to varsity athletic events and are encouraged to participate in intramural sports. Athletic facilities, situated in the lower part of the campus, make possible a wide variety of indoor and outdoor sports.

The University offers instruction in health and physical education and conducts a program of recreation and sports. Individual colleges within the University require specified courses in the field, as stated in succeeding portions of this catalog.

Intramurals supplement regular physical education courses, and students are encouraged to participate in these sports.

University teams compete in the following varsity sports: baseball, basketball, football, golf, swimming, tennis, track, volleyball, wrestling.

Although the University takes reasonable precautions, it assumes no responsibility for injuries students receive in sports or games. All students participating in varsity sports are insured against accidents.

STUDENT SERVICES

Student Health Service

The Student Health Service is set up to assist all students in maintaining their state of health while attending the University of Hawaii. Every daytime registered student is eligible for these services, but the student is first required to have a medical examination performed by his personal physician and the results of this examination must be entered on the health form provided by the University. Payment for this medical examination is the personal responsibility of the student.

Health services will be denied to any student not providing this completed health form. In addition, students should be forewarned that medical clearances permitting them to enroll in physical education courses, intramural sports programs, etc., will be denied students not meeting this medical requirement.

The service offers a medical care program similar to that of the general office practice of medicine. A dispensary provides out-patient physician and nursing care 8:00 a.m. to 4:30 p.m. Monday through Friday and from 9:00 a.m. to 11:00 a.m. on Saturdays. The infirmary can provide beds for medical care for minor illnesses and injury on a 24-hour basis seven days a week during regular sessions of the University. A nurse is on continuous duty for the dispensary and infirmary services, and a physician remains on call during evenings and weekends.

A student may need to be referred to a physician in private practice for medical problems beyond the scope of the Student Health Service, for which the student must bear the total financial responsibility. Therefore, every student is well advised to enroll in a supplemental health insurance program in order to gain these off campus medical and hospital care services. The Students' Accident and Sickness Medical Expense Plan sponsored by the ASUH is better tailored to meet student needs and is highly recommended.

Tuberculosis remains a distinct health hazard for all students. A tuberculin test is required of every student, and if found to be negative, he is cleared for all activities for four years. Those individuals with positive tuberculin tests must have follow-up chest x-rays on an annual basis. In view of the very much higher incidence of tuberculosis in foreign students, chest x-rays are required for admission to the University, rather than a tuberculin test; however, once on campus, they fall under the same medical requirements as spelled out above for all students. Failure to comply with medical requirements may preclude registration.

Counseling and Testing Center

The Counseling and Testing Center's staff consists of professionally trained psychologists, psychiatrists, counseling psychiatric social workers, psychometrists and interns, who, as a team, function on the campus in the areas of student service, graduate training and academic research. Educational, vocational and personal counseling is available to students. Various aptitude, interest and other psychological tests are often used as aids in the counseling process. The Center also maintains an educational and vocational library and administers a reading improvement program.

University Placement and Career Planning

The Office of University Placement and Career Planning assists students and alumni in the selection and pursuit of an optimum career. Services are provided in areas of self-analysis, vocational information, specific job opportunities, job campaigns, evaluation of offers, and graduate studies. The office cultivates the interest of prospective island, mainland and overseas employers and provides them with facilities to contact students and former students available for employment. Recruiting literature, annual statements, graduate and professional school bulletins, copies of the College Placement Annual and other career references are provided. Credential files are established for students interested in an academic career.

Campus interviews are scheduled with recruiting representatives of mainland and Hawaii organizations that offer career opportunities in business and industry, education and government. A number of recruiting firms are interested in hiring foreign students for employment in their home countries. In addition several hundred employment opportunities are listed with the office by employers who find it impractical to make campus visits.

Early registration is encouraged during the final year of study.

International Student Office

The International Student Office serves both foreign and American students. It helps those from other countries with immigration requirements, financial problems, living arrangements and other University and community matters. Special orientation programs are held at the beginning of each semester; foreign students admitted to the University are notified in advance and urged to arrive in time to attend them.

The office, located in Webster Hall 101, advises American students who seek opportunities for overseas study, service and travel, and who wish to engage in international student activities while at the University of Hawaii.

Non-U.S. students who are graduates of a university and are applying for admission to the University of Hawaii should write to: Graduate Division Student Services, University of Hawaii, 2540 Maile Way, Honolulu, Hawaii 96822. Those interested in undergraduate admission should contact: Office of Admissions and Records, University of Hawaii, 2444 Dole Street, Honolulu, Hawaii 96822.

Lockers

Steel book lockers for students are available in Wist Hall. Use of a locker for the first and second semesters may be obtained by calling campus local 8961 with the number of the locker desired. The Facilities Management Office will advise the student about pickup of the key. All keys must be returned before Commencement.

STUDENT REGULATIONS

Student Conduct

Students are expected to observe accepted University and community standards of conduct. Disciplinary authority is exercised by the Committee on Student Conduct, composed of the deans of several colleges, faculty members and students appointed by the president of the University, and the vice-president for student affairs.

Financial Obligations to the University. Students who have not adjusted their financial obligations (traffic violations, library fines, locker fees, laboratory breakage charges, transcript fees, loans past due, etc.) to the satisfaction of the business office may be denied graduation, transcripts, and further registration.

Intoxicating Beverages. Intoxicating beverages are prohibited on the campus and in affiliated buildings, including dormitories and facilities for all fraternities, sororities and other organizations.

Lethal Weapons. Firearms and spear guns are prohibited in dormitories and environs.

Parking and Traffic

Students are expected to familiarize themselves with the University's parking and traffic rules and regulations established by the board of regents. These regulations and special instructions may be obtained at the Admissions and Records Office in Bachman Hall, at the Traffic Desk in the Auxiliary Services building, and also during registration periods at the lanai area of the swimming pool located in the quarry. *Ignorance of these rules and regulations will not excuse a student from the payment of fines for violations.*

Parking permits are sold in the lanai of the swimming pool (quarry) during registration periods, and at the Traffic Desk in the Auxiliary Services building throughout the year.

STUDENT HOUSING

The student must be fully aware of several problem areas in making plans to attend the University of Hawaii.

First, finding suitable housing will be a major problem unless handled in advance of academic registration. Acceptance to the University does NOT assure one of housing. Housing in this community is scarce, difficult to find and expensive.

Second, there is only a limited number of residence hall facilities on campus. Almost all of these assignments go to state of Hawaii residents since priority is given to these students. There are no facilities on campus for married students. The Student Housing Office keeps listings of available off-campus spaces but most of these are small units scattered throughout Honolulu. These units are limited and reserved usually a month or more in advance of a term. Remaining facilities are usually farther away from campus and very expensive.

The student is cautioned to be prepared to make temporary housing arrangements in hotels or other quarters, if possible in advance, and to bear in mind that rental rates can quickly use up personal funds. He must utilize all possible avenues of searching for housing including newspapers, rental agencies, personal or professional contacts in the community or other sources.

Inquiries concerning student housing should be directed to the Student Housing Office, Johnson Hall-A, 2555 Dole Street, Honolulu, Hawaii 96822.

On Campus

Residence halls for regular University students administered by the Student Housing Office include:

Frear Hall, Hale Kahawai, Hale Laulima — (for undergraduate women) \$365* room and board per semester.

Johnson Hall — (for undergraduate men) \$365* room and board per semester.

Gateway House — (for graduate and upper division undergraduate men and women) \$390* room and board per semester.

Board includes 10 meals per week.

*Room and board charges may be subject to change with 30 days notice.

All halls have double rooms except for a limited number of single rooms at Hale Laulima at \$415* room and board per semester.

Off Campus

The rush for off-campus accommodations usually starts about three weeks prior to beginning of classes.

The housing office offers listings of rooms in private homes, a few apartments, and room and board jobs. These units are not inspected and negotiations with landlords are made directly by students.

Names of landlords are not available through the mail because of a rapid turnover in a tight housing market. Names of students looking for roommates are also not available.

There is no place on campus to which luggage or mail may be forwarded ahead of arrival.

Food Services

In addition to the Gateway House cafeteria, dining facilities on campus include:

Hemenway Hall Cafeteria. Meals a la carte are served.

East-West Center Cafeteria. A complete food service in Jefferson Hall, including a cafeteria, a snack bar and private dining rooms.

A *snack bar* in the northeast section of the campus.

Expenses

Minimum expenses are estimated at approximately \$2,175 per year for board, room, tuition, registration, course fees, class and student body fees, and books. Off-campus housing may be higher. These estimates do not include the cost of medical or dental expenses, additional dependents or transportation. Students from outside the state should add the cost of transportation to and from Hawaii and additional items for adjustment in a new community.

Refer to "Tuition and Fees" section beginning on p. 35 for further information.

*Room and board charges may be subject to change with 30 days notice.

FINANCIAL AIDS

The Office of Financial Aids is concerned primarily with assisting students who have financial need to continue or complete their education at the University of Hawaii. This assistance may be in the form of scholarships, grants, loans and/or student employment. Correspondence should be addressed to: Director, Office of Financial Aids, Bachman Annex 2 Addition, University of Hawaii, 2444 Dole Street, Honolulu, Hawaii 96822. Prospective graduate students who need financial assistance should write to: Dean of the Graduate Division, 2540 Maile Way, Honolulu, Hawaii 96822.

Scholarships and Grants

Privately Endowed—Grants and Other Aids

The General Motors Corporation provides a grant for an entering freshman good for four years if a satisfactory record is maintained.

The United Air Lines—W. A. Patterson scholarships to freshmen from the state of Hawaii.

The Charles R. Hemenway Scholarship Trust offers scholarships to undergraduate students.

The Link Foundation provides summer session scholarships of \$300 for secondary school science teachers studying oceanography.

The Matson Navigation Company offers four \$500 scholarships each year to juniors and seniors in the College of Business Administration.

The Ruby Ethel Kono Scholarship is awarded to a woman student majoring in Far Eastern art and culture or in voice.

Government Employees Mutual offers four \$500 scholarships for entering freshmen.

Hawaii Veterans Memorial Fund provides scholarships for undergraduate students.

The Kekaha Sugar Company offers a four-year scholarship of \$250 a year to a young man whose family is connected with the company. Information may be obtained from the company.

The Edward K. S. Park Memorial Scholarship to an undergraduate civil engineering student.

The Kenny Gruenhagen Foundation Scholarships for a senior student in art and a senior student in architecture.

Information on the above grants, except Kekaha Sugar Co. scholarship, may be obtained from the Scholarship Committee.

Government Scholarships

State Scholarships. Sixty-four scholarships, 54 divided among senatorial districts and 10 held at large, are awarded annually to freshmen, for four years, provided the beneficiary maintains a satisfactory record.

Board of Regents Scholarships. Ninety tuition scholarships awarded each year; ten reserved for foreign students.

Other Scholarships

Other Scholarships Administered by the Scholarship Committee. Alonzo Gartley (in agriculture); ASUH Scholarship-Leadership grants; Chi Epsilon (Civil Engineering); Chinese Community; Emma K. Mossman; Fushiminomiya Memorial Scholarship Endowment Fund; Harry H. Collins; Hawaiian Airlines; Hawaiian Telephone; Honolulu Civic Club; ILWU (Social Work); Iota Alpha Fraternity; John Fee Embree; Kazuo and Akiyo Totoki; Kenji Yamaguma Memorial; Korean Foundation; Korean University Club; Leora Parmlee Dean (sponsored by the Women's Campus Club); Music Department; Riley H. Allen Memorial Fund; Ruth C. Scudder Memorial (sponsored by the Women's League of Central Union Church); Joseph F. Smith Memorial; Stephen Spaulding; Theodore R. Rhea Hawaii Cancer Society Memorial; Honolulu Kumamoto Kenjin Kai (Japanese Language); Honolulu Police Relief Association; Robinson A. McWayne Memorial Scholarship.

Scholarships Administered by Individuals and Private Organizations, with Assistance from the University Scholarship Committee. Alfred Apaka Memorial; Antone Vidinha, Jr., Fund; Associated Chinese University Women; Chinese Women's Club; Dole Corporation; Francis H. Kanahale Memorial; Fred Dailey Waikikian; Hale Nani Hospital; Hawaii Hotel Association; HGEA, University Chapter; Honolulu Japanese Junior Chamber of Commerce (Nurses); Joseph F. Smith Memorial; Keane Art; Ke Anuenue Alumni Sorority; Leilehua Parent Teachers Association; Liberty Bank of Honolulu; Miles E. Cary Memorial; Pacific Concrete and Rock Co.; Palolo Lions Club; Ralston Purina; Society of American Military Engineers; Soroptimist Club; Standard Oil Company FFA; Theodore Char, CPA Accounting; Wahiawa Lions Club; Wahiawa-Waialua Rotary Club; West Honolulu Rotary; Women's Auxiliary of the Home Builders Association of Hawaii.

Scholarships Administered Entirely by Private Organizations. The Scholarship Committee has no direct information about the independent awards listed below: Aiea High School PTA; Aiea Lions Club; Ala Moana Lions Club; Beta Sigma Phi Sorority; Betty Crocker; Brother David Paluhi; Central Maui Hawaiian Civic Club; Chinese University Club; "Chu" Baldwin Kahanamoku Foundation; Ewa Beach Lions; Filipino Scholarship Foundation; First Trust Company of Hilo; Fort Shafter NCO Wives Club; General Henry Arnold Education Fund, U. S. Air Force Aid Society; Harold B. Turney-Dorothy K. Gillett Music Fund; Hawaii Veterans Memorial Fund; Hawaiian Civic Club; Honolulu Community Chest; Hui O'Wahine, Fort Shafter Women's Club; Hui Pookela Honorary; IBEW, Unit 1, Local Union 1186; ILWU, Naalehu Unit, Local 42; Independent Telephone Pioneer Association; Kailua Hawaiian Civic Club; Kailua High School; Kalia Lions Club; Kamehameha School; Koko Head Lions Club; Lahainaluna P.T.A.; Leeward Oahu Junior Chamber of Commerce; Leeward Oahu Lions Club; Leilehua P.T.A.; Leilehua F.T.A.; Leonard's Bakery; March of Dimes Health Careers; McKinley High School National Honor Society; Pacific Fellowship (sponsored by the American Association of University Women); Pali Lions; Peter H.

Fukunaga Foundation; Rama Watumull Fund; Star Markets, Ltd.; United Okinawan Association of Hawaii; Wahiawa Filipino Community Association; Wahiawa Hawaiian Civic Club; Waialua Agricultural Co.; Waialua Hawaiian Civic Club; Waialua High School P.T.A.; Waialua Lions Club; Wallace Rider Farrington (for graduates of Farrington High School sponsored by the Honolulu Star-Bulletin); Wong Kong Har Tong Society; Yang Chung Hui Sorority.

Federal Grant Program. The University of Hawaii participates in the Federal Educational Opportunity Grant Program which provides assistance to undergraduate students with exceptional financial need. Grants range from \$200 to \$1,000 a year and can be no more than one-half of the total assistance given to the student.

Loans

Through the generosity of various organizations and individuals, certain funds have been provided from which students may borrow—either in small amounts to meet emergencies or in larger sums to defer part of tuition costs. These loans are to be paid before the end of the semester or summer session during which they were borrowed. First year students (freshmen and transfers) are not eligible for these loans if their permanent residence is other than Hawaii. A student wishing to make use of these funds should consult one of the financial aid counselors. Loan funds include the following:

Alumni Fund—Molokai Chapter; Andrew J. Salz Fund; Carey D. Miller Fund; Chinese Students' Alliance Fund; Commerce Club Fund; Edgar Wood Memorial Fund; Future Farmers of America, Uniwai Chapter Fund; George H. Lamy Fund; Gruscidad Fund; Hawaiian University Association Fund; Helen Strong Carter Dental Fund; Honolulu Civic Association Fund; Inez Wheeler Westgate Fund; Japanese Students' Alliance Fund; Louise S. Jessen Memorial Fund; Mary L. Kelsey Fund; Minnesota Club Fund; Moir-Ross Health Fund; N.G.B. Fund; Ruth Alexander, M.D., Student Fund; Representatives Club Fund; Ruth Betzner Fund; Senior Class Fund; Student Fund of the College of Education; Theodore T. Kawahara Memorial Fund; Wahiawa-Waialua Rotary Fund.

Federal Loan Programs. The National Defense Student Loan, Nursing Student Loan, Medical Student Loan and Law Enforcement Loan programs are available to qualified students attending the University of Hawaii. Students are not required to repay any of the principal or interest until nine months after leaving their studies. For the borrowers who enter the teaching or nursing professions, it is possible for them to cancel part or, in case of some teachers, all of their loans if certain conditions are met. Applications for these loans are available in the Office of Financial Aids.

Students wanting to borrow through the Federal Guaranteed Loan Program must process their applications through the agency designated in the state where they maintain permanent residence. Hawaiian students are required to go through the State Department of Budget and Finance.

(In Hawaii this is the same as the United Student Aid Fund Loan. Application forms are available from the Department of Budget and Finance, commercial lending institutions, or Financial Aids Office, University of Hawaii.)

Student Employment

The University of Hawaii participates in the Federal College Work-Study Program and also employs students to work part-time in offices, laboratories, libraries, in maintenance work and other jobs on campus.

Students who plan to work their way through college are advised to have funds for all major expenses (tuition, books, room, board, clothing and travel) for the first year. Keen competition for jobs as well as the problems of adjusting to university life make it difficult for first year students to earn more than limited spending money.

Applications for student employment are obtained from the Financial Aids Office. Preference is given to students with greatest need for financial assistance in order to continue their education.

PRIZES AND AWARDS

General Honors

Deans' List. Shortly after the close of each semester the *Deans' List* gives the names of all full-time undergraduate students who achieved a grade-point average of 3.5 or above for the preceding semester.

Honorary Societies. Chapters of national honorary societies at the University include Phi Beta Kappa Alpha chapter (liberal arts and sciences); Phi Kappa Phi Hawaii chapter (general scholarship); Sigma Xi (sciences); Pi Gamma Mu (social sciences); Phi Delta Kappa (education); Sigma Pi Sigma (physics); Delta Sigma Rho (forensics); Chi Epsilon (civil engineering); Eta Kappa Nu Association (electrical engineering); Omicron Delta Kappa (scholarship and leadership); Phi Eta Sigma (freshman men); Mortar Board Hui Pookela chapter (senior women); Alpha Lambda Delta (freshman women); Pi Lambda Theta Beta Zeta chapter (women in education); Delta Phi Alpha (German); Pi Delta Phi (French); Beta Phi Mu (library studies).

General Awards

American Institute of Chemists' Award for outstanding achievement in chemistry.

Arthur Lyman Dean Prize for Undergraduate Research—any senior may compete for this prize by presenting a thesis reporting fully his research in any field of intellectual endeavor. The winning paper is placed in the Hawaiian and Pacific Collection of Sinclair Library.

Bernadine Siu Yin Ho Memorial Speech Award, a cash prize for excel-

lence, dedication and service to the University's forensics program. The winner's name is engraved on a perpetual trophy.

Carl F. Knobloch Prize in Government, cash prize to the outstanding student in the field of political science.

Charles Eugene Banks Memorial Prize, cash prize awarded each year to the student whose manuscript is judged the best in a creative writing contest. This manuscript is placed in the Hawaiian and Pacific Collection of Sinclair Library.

Charles F. Loomis Prize, cash award to an undergraduate for outstanding contribution to understanding of people and events in Asia or the Pacific Basin. Entries in the competition may be research or interpretive papers.

Departmental Awards, ASUH Certificates, to students who performed outstanding services for their departments while maintaining excellent scholastic records.

Ernest Hemingway Memorial Award, annual cash award to junior student, resident of this state, for creative and original writing ability.

Faculty Club Prize, cash award to the senior who graduates with the second highest scholastic record in the class.

Hawaiian Botanical Society Award, annual cash award and perpetual plaque in the department of botany, honoring a senior for outstanding academic record in the plant sciences.

Health Award Scholarship in medicine, for outstanding academic record and achievement in the pre-medical program.

Joseph Fielding Smith Memorial Award, annual cash award for outstanding performance in speech-communication arts. Academic record considered.

Library Prize for Pacific Research, two cash awards (graduate and undergraduate) for the best papers based upon research in the Pacific area. The prize-winning papers are placed in the Hawaiian and Pacific Collection of Sinclair Library.

Merck Drug Company Award, for outstanding achievement in chemistry.

O. C. Magistad Award of the Hawaiian Section of the American Chemical Society. A one-year membership and subscriptions to several journals to the outstanding senior in chemistry. The winner's name is engraved on a bronze plaque.

Phi Beta Kappa Recognition Award, made in recognition of high scholastic standing among sophomores in arts and sciences.

Phi Kappa Phi Prize, cash awarded by the Hawaii Chapter to the senior who graduates with the highest scholastic record in the class.

Ralph S. Kuykendall Prize in History, granted to the outstanding history major in the graduating class.

Real Dean Award of Honor, medal award in recognition of four years of outstanding service in student activities.

Sigma Pi Sigma Scholarship Award, presented annually to outstanding student in physics.

Tarakanath Das Prize in Asian History and Politics, an annual cash prize, offered by the Tarakanath Das Foundation, to a senior submitting the best essay on a selected topic in the field.

Theatre Group Annual Award, medal awarded to an undergraduate for outstanding contribution to the University Theatre.

Theatre Group Playwriting Prizes, cash prizes awarded annually for the three best original short plays written by Hawaii residents.

Business Administration

Business Education Award of Merit for outstanding achievement in the field.

Dean Wermel Memorial Plaque, a perpetual plaque honoring the outstanding senior in business administration each year.

Outstanding Junior in Business Administration, a plaque awarded to the outstanding junior in the field.

Outstanding Seniors in Accounting, cash awards made annually to three outstanding seniors in the field.

Outstanding Senior in Business Economics and Statistics, a perpetual plaque honoring the outstanding senior in the field.

Outstanding Senior in Finance, Insurance, Law, and Real Estate, a perpetual plaque honoring the outstanding senior in the department.

Outstanding Senior in Management, a perpetual plaque honoring the outstanding senior in the field.

Outstanding Senior in Marketing, a perpetual plaque honoring the outstanding senior in the field.

Outstanding Senior in Personnel and Industrial Relations, a perpetual plaque honoring the outstanding senior in the field.

Outstanding Senior in Travel Industry Management, a perpetual plaque honoring the outstanding senior in the field.

Outstanding Sophomore in Business Administration, a plaque awarded to the outstanding sophomore in the field.

Engineering

American Society of Civil Engineers Award, Hawaii Section, a cash prize and a year's membership in the Society to an outstanding senior in civil engineering.

American Society of Civil Engineers Wives' Auxiliary Award, to five outstanding graduates in civil engineering.

American Society of Mechanical Engineers Wives' Auxiliary Award, to three outstanding seniors in mechanical engineering.

Chi Epsilon Freshman Award, to an outstanding engineering freshman.

Eta Kappa Nu Sophomore Award, to the engineering sophomore making the highest grade-point ratio.

Robert Edwin Hughes Award in Engineering, for outstanding engineering report-design, accomplishment or achievement by an undergraduate in the field.

Agriculture and Human Resources Development

For awards in Agriculture and Human Resources Development, check with the respective divisions in the College of Tropical Agriculture.

Military Science and Aerospace Studies

Best Soldier Award, to the sophomore Army ROTC cadet who attained highest ROTC grades for the academic year.

Best Soldier Award, medal presented by the Honolulu Star-Bulletin to the freshman cadet who attained the highest grades in ROTC for the academic year.

Captain H. Gaylord Dillingham Memorial Award, to the Air Force ROTC cadet having the highest scholastic record at the end of the sophomore year and who is approved for advanced training.

Major John A. Johnson Memorial Award, cash award, presented to the Army ROTC cadet with the best scholastic record at the end of the sophomore year and who is approved for advanced training.

Warrior of the Pacific Trophy. The Department of the Army supervises an annual rifle marksmanship competition among ROTC infantry units in universities for possession of a bronze statuette of a native Hawaiian soldier. Residents of Hawaii offer the trophy.

Society of American Military Engineers, a cash award to distinguished junior and senior engineering cadets in both Army and Air Force ROTC.

Air Force ROTC Financial Assistance Grants, scholarships to deserving applicants which cover tuition, fees, laboratory and graduation expenses.

Nursing

Hui Kahu Ma'i Award for Leadership, in nursing.

Hui Kahu Ma'i Professional Nurse Award.

Hui Kahu Ma'i Scholarship Award, in nursing.

Hui Kahu Ma'i Service Award, in nursing.

Tuition and Fees*

Regular Session Fees

Fees are charged according to the number of semester hours carried by the student; auditors (those enrolled in a course for no credit) pay the same fees as students enrolled for credit. Out-of-state students pay the same fees as resident students.

Full-time students (12 or more credit hours) per semester:

Tuition	\$85.00
General Fee	18.00
Course fees for applied music and institutes (see listings under appropriate colleges)	
Activities Fees† (for all undergraduate students)	13.25

Part-time students (less than 12 credit hours)

Tuition (maximum of \$85.00) – (per credit hour)	9.00
No General Fee	
No Activities Fees	

Students registered in the Division of Continuing Education pay fees as indicated in the bulletins of that division.

Summer Session Fees

Tuition (courses audited or taken for credit) (per credit hour)	\$16.00
Student Activity Fee (applies to 1st term)	2.50
Course fees for applied music, institutes, and other special programs as noted in <i>Summer Session Bulletin</i> .	

<p>*The tuition and fee schedule set forth here may be changed for 1969–70.</p>
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†For students taking fewer than 12 credit hours, the fees are optional and the benefits limited. These fees are not collected for the summer session. Complete details are available at the Bureau of Student Activities.

TUITION AND FEES

Other Registration Fees

Late registration fee which is added to the student fees when a student registers or pays the fees after the announced days of registration	\$5.00
Change of program after the initial registration	2.00
(does not apply to complete withdrawals from the University)	

Graduation Fees

Graduation Fee: (payable at time of application)	
Bachelor's degree (each)	5.00
Advanced degree (each)	5.00
Five-Year certificate	2.50
Associate of Science	2.50
Thesis Binding, 2 copies	4.00
Rental of Cap and Gown	4.00
Rental of Master's Hood	4.50
Rental of Doctoral Hood	5.00

Special Fees

Credential Evaluation Fee (all out-of-state applicants) *	10.00
Transcript of Record (no charge for first copy)	1.00
Credit by Examination	5.00
(payable at time of application)	
Special Examination	10.00
(in regularly constituted courses at other than the specified times, except for make-up examinations)	
Replacement of laboratory equipment	
(items broken or lost)	Cost of Item
Check tendered to University or any department therein and returned for any cause:	
Drawn on bank within State of Hawaii	5.00
Drawn on bank outside State of Hawaii	10.00

*Applications from outside Hawaii must be accompanied by a \$10.00 application (money order, cashier's check, or certified check). This fee is non-refundable and will not be credited toward tuition, though the applicant is admitted to the University.

Payments

For registration to be official all fees must be paid within 24 hours after the close of the final day of regular registration.

Refunds

Only tuition and special course fees for the academic year may be refunded to students who withdraw from courses, the percentage refunded to be in accordance with the following schedule:

Withdrawal during

first two weeks of instruction, 80%

third and fourth weeks of instruction, 40%

remainder of semester, 0%

For summer session refund schedule see *Summer Session Bulletin*.

Applications for refunds must be made at the treasury office, and approved by the dean concerned.

Veterans

Veterans, or orphans of veterans, registering for the first time under any of the various federal veterans' bills, should present a proper Certificate for Education and Training or Certificate of Eligibility and Entitlement.

Academic Regulations

STUDENT CLASSIFICATION

Persons attending classes at the University of Hawaii enroll as students or auditors. Undergraduate and graduate students enroll for credit. Auditors are permitted to attend classes but receive no credit for the course. Students may be designated as *classified* or *unclassified*, *full-time* or *part-time*.

Classified Students

Undergraduates are designated *classified* or *unclassified* students. *Classified* students follow prescribed programs of study leading to the bachelor's degree. Undergraduates are divided as follows: freshmen, 0-24 credit hours completed; sophomores, 25-54; juniors, 55-88; seniors, 89 or more. Freshmen and sophomores are lower-division students; juniors and seniors are upper-division students.

Graduate students (graduates of this University or other institutions of approved standing) are designated *classified*, *five-year diploma candidates* or *unclassified*.

Those admitted to the University's Graduate Division are termed *classified* students, in one of three categories: regular, probational and special. These students work toward advanced degrees or in special non-degree training or certificate programs.

Five-year diploma candidates are graduate students in the College of Education following a curriculum leading to that diploma.

Unclassified Students

Undergraduate and graduate students who are not candidates for a degree are termed *unclassified* students in their respective divisions. Both enroll in the Division of Continuing Education. Some unclassified graduate students work toward the professional certificate of the State Department of Education, and others later seek admission to the Graduate Division. The unclassified status may not be used to evade technical or scholastic requirements of the college, school or Graduate Division.

Full-time and Part-time Students

Undergraduates, graduates and unclassified students may be either part-time or full-time students. Such terms are for registration purposes

only and have no further significance. Ordinarily a full-time student carries a minimum of 12 credits. Graduate students are considered full-time or part-time according to Graduate Division regulation. Unclassified students are ineligible for student deferments by the Selective Service System.

Auditors

Auditors are those students who are permitted to attend certain classes with the consent of the instructor. No credit is given for a course which is audited. In general, auditors are not allowed in laboratory science, mathematics, elementary and intermediate modern languages, English composition, speech or studio art courses, or in classes limited in size where credit students might thereby be excluded. Auditors do not take course examinations. The extent of their classroom participation is at the option of the instructor. No records are kept by the admissions and records office for auditors.

ADMISSION INFORMATION FOR ENTERING STUDENTS

Admission of Undergraduates

Candidates for undergraduate admission to the University of Hawaii must present satisfactory evidence of ability to do university work. Usually this is done in terms of previous academic records, scores on the Scholastic Aptitude Test and recommendations.

Applications and correspondence should be directed to:

Director, Office of Admissions and Records
Bachman Hall 125
University of Hawaii
2444 Dole Street
Honolulu, Hawaii 96822

Applications and all credentials must be received by July 1 for admission in the fall semester and by December 1 for the spring semester.

The University of Hawaii uses social security numbers as student numbers. Students are required to give their social security number on their application forms. Students should also acquaint themselves with zip codes of their permanent and local addresses for correspondence purposes.

Admission of Residents as Freshmen

Residents of the state of Hawaii applying for admission as freshmen must submit scores on the Scholastic Aptitude Test of the College Entrance Examination Board, high school transcripts and recommendations from qualified persons. A high rating in one factor will not insure admission, nor will poor performance in another area exclude an applicant if other evidence indicates that he might be successful in university work.

ACADEMIC REGULATIONS

Ordinarily a student should achieve a *B* or better average in high school. The quality of work done during the last two years in secondary school receives special consideration.

Candidates for fall admission should take the Scholastic Aptitude Test before or during December of the senior year in high school. Candidates for spring admission should plan to take the test before or during July. For information on the SAT test, consult a high school counselor or write to the nearest CEEB center:

College Entrance Examination Board

c/o Educational Testing Service

Box 1025

Berkeley, California 94701

or Box 592

Princeton, New Jersey 08540

Minimum Unit Requirements for Admission

From a 4-Year High School	Subject	From a 3-Year High School
3	ENGLISH	3
1	ALGEBRA	1 (Not required if the student has had elem. algebra in the ninth grade.)
6	ENGLISH—In addition to the 3-unit minimum requirement in English.	4 (If applicant offers elementary algebra this requirement is 5 units.)
	SCIENCES—Physical, biological, and social.	
	MATHEMATICS—In addition to the 1-unit minimum requirement in mathematics.	
5	FOREIGN LANGUAGES — Entrance credit in foreign language is not granted unless the total number of foreign language units offered includes at least 2 units in some one language.	4
	Any other subjects (except physical education and ROTC) credited by the high school toward its diploma (no less than ½ nor more than 2 units in any one subject) provided that these subjects have been pursued in accordance with regular classroom procedure involving a reasonable amount of preparation in addition to the time spent in class.	
15	TOTAL	12

Every applicant must take the SAT and submit evidence that he has satisfactorily completed at least 15 units of work in a four-year high school or at least 12 units of work in a three-year high school.

The word *unit* as employed here signifies the satisfactory completion of a full school year's course of study, or the equivalent for laboratory and shop exercises. For an acceptable distribution of units required of entering students, see the accompanying table.

Admission of Out-of-State Students as Freshmen

Candidates applying for admission as freshmen to the University of Hawaii from outside the state should meet all the requirements noted for Hawaii applicants (see above). *Out-of-state candidates should await notice of acceptance before coming to Hawaii. No special consideration can be given to students who arrive at the last minute and whose credentials are not in order.*

Admissions decisions are made without regard to the availability of housing. It is the student's responsibility to arrange for housing.

Admission of Transfer Students

Candidates for admission currently enrolled in other universities, colleges or institutions of higher learning must file their applications and credentials with the office of admissions and records by July 1 for admission in the fall semester and by December 1 for admission in the spring semester.

Students who transfer from other accredited universities and colleges may be granted advanced standing. Official transcripts from all institutions attended must be sent to the director of admissions and records. Each transcript must include a listing of courses taken, the grade received in each and a note of honorable discharge from the institution. These transcripts become a permanent part of University files. A supplementary transcript of courses in progress must also be sent to the admissions and records office at the end of the semester. If a supplementary transcript is not submitted, it will be assumed that the student has decided not to enter the University. Candidates who have not completed 24 acceptable academic credits must also submit high school transcripts and scores on the Scholastic Aptitude Test of the College Entrance Examination Board.

Transfer credits are accepted only in subjects substantially equivalent to University of Hawaii offerings, and grades earned in these courses must be C or better to be recorded. However, all transfer credits allowed may not necessarily satisfy curricular requirements toward a degree. Therefore, the student may find that it will take longer to complete degree requirements than anticipated. No more than 60 semester hours are accepted in transfer from a junior college.

Students transferring from unaccredited institutions must meet University of Hawaii standards of admission. Upon the completion of a mini-

imum of 30 semester hours with an average of C or better, credit may be given for courses at the previous institution. Such credit, however, will not exceed 60 semester hours, and will be granted only for courses usually considered lower division and substantially equivalent to University offerings.

Admission of Foreign Students

Foreign candidates applying for undergraduate admission to the University of Hawaii must file their applications and credentials with the office of admissions and records by June 1 for admission in the fall semester, November 1 for admission in the spring, and April 1 for admission in the summer. Students should have received official notification of acceptance from the University of Hawaii before coming to Hawaii.

Requests for admissions information and materials should be directed to: Office of Admissions and Records, Bachman Hall 125, 2444 Dole Street, Honolulu, Hawaii 96822.

Candidates must present evidence of having completed or received the equivalent of a U.S. high school diploma and of having a satisfactory level of proficiency in English. Applicants must submit official transcripts of all secondary and post-secondary work. These transcripts become a permanent part of the University's files and cannot be returned to the students.

Admission of Mature Persons

Mature persons may register as special students when their backgrounds qualify them for credit work. Such students, however, will not be admitted to a degree-granting college or allowed to become a degree candidate unless all admission requirements have been satisfied. Approval from the director of admissions is needed before a student may register.

Admission as a special student in no case serves as a means of avoiding compliance with requirements laid down for regular students.

Admission of Veterans and Other Individuals

Veterans and other individuals may take examinations covering preparatory school subjects as a means of fulfilling unit requirements. Successful performance on these and the Scholastic Aptitude Test will admit these candidates to the University. Such individuals, however, must meet all special requirements for admission to such curricula as engineering, agriculture and nursing. It is understood that persons in this category will become degree candidates.

Admission of Returnees in Good Standing

A student who left the University of Hawaii in good standing or on probation and who has not attended another institution must submit a returnee form (available from admissions office) by July 1 for the fall semester, by December 1 for the spring semester, to the office of admissions and records. A student who has attended another institution applies as a transfer student.

Admission to Certain Undergraduate Programs

Candidates for admission to certain programs must meet special requirements. Each applicant should study the conditions set by the college he intends to enter and for the program he intends to pursue in that college. Special attention is directed to the following requirements.

Arts & Sciences

All prospective students of the College of Arts and Sciences are strongly advised to offer at least two years of college preparatory mathematics and three years of a foreign language.

Students who expect to select as their major areas of study mathematics, the natural, biological or physical sciences, and most social sciences, must have had plane geometry, two years of algebra, and trigonometry, or their equivalents. Solid geometry is also strongly recommended.

Engineering

Prospective engineering students must have had plane geometry, two years of algebra, and trigonometry. It is strongly recommended that they also have mechanical drawing, physics and solid geometry. Engineering students who have not completed trigonometry or mechanical drawing in high school should arrange to take these subjects during the summer session preceding their freshman year.

Allied Health

Applicants for admission to the dental hygiene program are required to take the American Dental Hygienists' Association Aptitude Test. Information about the test and the application may be obtained from the department of dental hygiene or the American Dental Hygienists' Association, 304 East 45th Street, New York, New York 10017.

Prospective students of medical technology should have completed at least two years of algebra, a unit of plane geometry and one of trigonometry. A course in pre-calculus is recommended. A year of chemistry and a year of physics are strongly advised.

Business Administration

Prospective students of the College of Business Administration should have completed two years of algebra and one year of plane geometry or their equivalent. Trigonometry is strongly recommended.

Early Admission

Qualified high school juniors and seniors may enroll in University courses. Juniors may be admitted to the summer session before their senior

year, and seniors may carry one or two University courses during their last year of high school. Students desiring to take advantage of this program should ask their high schools to recommend them, arrange to have high school transcripts sent to the office of admissions and records, and take the Scholastic Aptitude Test of the College Entrance Examination Board. The continuance of these students in the early admission program is reviewable at the end of each term.

Selected Studies and Honors Program

Admission to the Selected Studies Program is by invitation to freshmen and sophomores whose high school records and aptitude test scores, or whose recommendations from the University faculty, indicate that they have the qualities needed to profit from the opportunity.

Juniors and seniors who wish to graduate with honors degrees may join the Honors Program. Application for admission to the program may be made by any regularly registered undergraduate at the end of his sophomore year or during his junior year.

Admission of Graduate Students

Graduates of accredited colleges and universities who wish to undertake graduate study in the University of Hawaii Graduate Division should apply to:

Graduate Division, Student Services
Spalding Hall 354
2540 Maile Way
University of Hawaii
Honolulu, Hawaii 96822

Each application should be accompanied by two official transcripts of work completed at all institutions of higher learning including the University of Hawaii. Admission to graduate study is provisional until such records are on file. These transcripts become a permanent part of University files.

Applications must be received by May 1 for the fall semester, November 1 for the spring semester, and April 1 for the summer session.

Consult the *Graduate Bulletin* for advanced degree programs and requirements. The bulletin may be obtained by writing to: University Bookstore, 1760 Donaghho Road, University of Hawaii, Honolulu, Hawaii 96822. The price is \$.40 surface mail and \$1.00 airmail to the U.S. and Canada; to all other countries, \$.25 plus sufficient postal coupons to cover airmail cost of 6-ounce catalog.

REGISTRATION FOR COURSES; WITHDRAWALS AND OTHER CHANGES

Regular Registration

Registration for courses is usually held one week prior to the opening of the semester. The dates for registration are given in the University Calendar (p. 3). Entering students receive circulars with instructions for registering. Courses are described in this catalog under the various college sections. A schedule stating the time and place of meetings for each course is issued by the records and admissions office prior to registration.

Regular attendance at class and laboratory sessions is expected for all courses in which a student enrolls. Unavoidable absence should be explained to the instructor concerned.

Undergraduates. Each undergraduate is assisted by a faculty adviser assigned by his college to help him prepare an academic program which meets the goals he sets for himself. Tuition and fees are payable at the time of registration. A student is not officially registered until he has paid his tuition and fees.

Graduates. Graduates follow the same procedure in registration as do undergraduates. Consult the Graduate Division for special instructions.

Auditors and Unclassified Students. Auditors and unclassified students register after the period assigned for the registration of classified undergraduate and graduate students. Instructions for auditors and unclassified students are issued at the beginning of each semester.

Late Registration

With written approval from the dean of his college, a student may register for credit (initial or as a result of program changes) only during and not later than the first eight class days following regular registration. See Calendar, "Last day of registration for credit." Similar restrictions apply to Summer Session.

Registration to audit courses is permitted at any time, but auditors may not change to credit status after the above late registration period.

Other Provisions

Maximum Registration. Students may not register for courses in the Division of Continuing Education, for credit or audit, in excess of the maximum registration allowed by the college in which they are enrolled. Students must carry a minimum of 12 credits to be considered full-time. Graduate students should consult the *Graduate Bulletin*.

Variable Credit Courses. The number of credits obtainable in most courses is stated in this catalog and in the schedule of courses available shortly before registration. However, certain courses, designated by "hours arranged," offer variable credit. Students in these courses usually carry on

individual work. The number of credits for which a student enrolls and will earn in such a course must be approved by the instructor at the time of registration. Students register for a definite number of credits and may earn no more or less than the stated number without the college dean's approval.

Course Changes. Students wishing to change a course or courses must follow the procedures given for withdrawing from a course (see below) and for late registration (see above). Forms are available at the college dean's office.

Withdrawal from Courses

To withdraw from a course, a student must have the written consent of the instructor of the course on a form available at the office of the department offering the course. After the student and instructor sign the form, the student keeps one copy, returns one to the instructor, and a third to the department office.

A student may withdraw from a course up to the last four weeks of the semester; he will receive a grade of *W* (withdrawal, not failing). After the last date for withdrawals, a student may receive a mark of *W* if and only if he completely withdraws from the University with the approval of the dean of the college in which he is registered. When a student ceases to attend class without officially withdrawing, the instructor may award one of two grades: *W* (withdrawal) or *I* (incomplete). The point during the semester at which the instructor will give an *I* rather than a *W* will be determined by the instructor, with the main criterion for the *I* being the feasibility of the student making up the work within the prescribed time limit for the next semester.

Refunds for withdrawals from courses are noted under "Tuition and Fees—Refunds." Students seeking tuition refunds for withdrawals from courses should see the business office in Bachman Hall immediately upon withdrawing, bringing with them their copy of the withdrawal form.

Transfers Within the University

A student may apply for transfer from one college to another during either semester. Application for transfer must be made on a form supplied by one of the deans concerned. The application must be approved by the deans of the two colleges and returned to the admissions and records office as soon as possible. Changes of college, curriculum or major are not permitted during registration periods.

CREDITS, GRADES, AND EXAMINATIONS

Work accomplished by students is usually recognized in terms of *credits*, *grades*, *grade points* and *grade-point ratios*. Grade reports are given out at the end of each term.

Credits. A *credit* (also called a *semester hour* or a *credit hour*) is given to a student for work satisfactorily accomplished during three hours a week spent in the preparation and recitation of assignments in a course, or in the field or laboratory. The normal division of time in non-laboratory courses is one hour in the classroom and two hours in preparatory work. Thus, a three-credit course signifies that the class usually meets three hours a week and that the student is expected to spend six hours in preparation of assignments.

Grades. *Grades* given in all courses are *A, B, C, D, F* and *I*, except for 800 (thesis research) in which the grade of *S* (satisfactory) is given upon acceptance of the thesis. The lowest passing grade is *D*.

An *I* is given to a student who has failed to complete a small but important part of a semester's work before the semester grades are determined, if the instructor believes that the failure was caused by conditions beyond the student's control and not by carelessness and procrastination. Instructors will send a report of "Incomplete" to each student receiving an *I*, indicating the steps to be taken to remove the *I*. The deadline for removing an *I* received in the first semester is the Easter recess of the following semester; for removing an *I* received in the second semester or the summer session, the deadline is the Thanksgiving recess of the next semester. When the instructor records a grade of *I* on the final grade card, he must also record the grade to which the *I* will revert if the work is not made up by the deadline; that grade should be computed on the basis of what grades or other evidence the instructor does have, averaged together with *F*'s for all the incompleted work (including the final examination, if it is not taken). If the work is completed prior to the deadline, the instructor will report a change of grade, taking the completed work into consideration.

For undergraduate students, credit in a course for which an *F* is given may be obtained only by passing the course, or its equivalent, either at the University of Hawaii or at some other accredited institution of higher learning.

Grade points are given for all courses in which grades are reported. They are computed as follows: for each credit received in a course, 4 grade points are granted if the grade is *A*, 3 if *B*, 2 if *C*, 1 if *D*, 0 if *F*.

Students entering as undergraduates with advanced standing are not given grade points for work done elsewhere. But on work done at the University of Hawaii, such students must gain grade points in the same proportion to credit hours required for graduation as that demanded of other students.

Grade-point ratios are determined by dividing the total number of grade points by the total number of credits for which a student has been registered. Courses for which grades of *W*, *I*, or *Pass* have been recorded are not included in the computation of ratios.

Grade Reports. Grade reports are sent to students through the mail at the end of each semester and summer session.

Pass-Fail. Undergraduate students may, with approval of their adviser, choose to take up to two courses a semester on a "pass" or "fail" basis, provided they are not on academic probation and that the course is not required by the college in the student's "major requirement." To qualify for a pass grade, the work of the student must be at least at the C-level. Departments may, at their option and upon the approval of the appropriate curriculum committee of the college, designate certain lower division introductory courses in the 100-199 series on a compulsory pass-fail basis, but these courses are exempt from the two pass-fail course maximum the student is permitted to take in any one semester. No more than forty (40) credit hours taken on a pass-fail basis may be counted toward the degree. A grade of "P" (pass) is not computed in the grade-point average; however, a grade of "F" (fail) is.

Examinations

Course Examinations. Final examinations are required in all undergraduate courses except directed reading, research and seminar courses. No examinations (other than short quizzes) are allowed during the two weeks prior to the final examination period. The schedule of final examinations is issued by the office of admissions and records prior to the testing period.

Foreign Language Placement Examinations. All students who have had previous study of foreign language courses and intend to continue their study of that language at the University of Hawaii must, prior to enrollment in a course, take a placement test which will assist in determining in which course they should enroll. Registration for foreign language courses will not be permitted until proper placement has been determined. For further information, contact the offices of the European languages department (Webster 301) or the Asian and Pacific languages department (Webster 221).

Credit for Previous Foreign Language Study. Credit towards graduation for learning of foreign languages which has been accomplished outside the University of Hawaii may be granted in one of five ways: by transfer from another institution, by placement, by regular credit by examination, by special credit by examination, or through the Advanced Placement Program.

For students who have taken the placement test (see above), completion with a grade not lower than C or its equivalent, of the course in which a student has been placed, will result in his automatically receiving credit not only for the course he has passed but also for all *lower division* courses which are prerequisite to that course, up to a maximum of 14 credits.

Students who do not wish to enroll in a foreign language course (e.g., because they have completed their requirement or because they are enrolled in a college which has no such requirement) may receive credit for *lower division* foreign language study completed outside the University of Hawaii (up to a maximum of 14 hours) by passing a special credit examination administered by the appropriate foreign language department. Apply to department offices for further details. Credit for other language work may be achieved by the regular credit by examination procedure (see below).

A minimum of four credits towards graduation may also be obtained by means of attaining a score of 3 or better on the Advanced Placement Examination in French, German, Latin or Spanish. (The amount of credits in excess of four is determined by the results of the placement examination administered by the European languages department.) The Advanced Placement Examinations are administered in high schools by the Educational Testing Service for the College Entrance Examination Board on a nationwide basis for students who have completed specific college level courses in high school. Further information may be obtained in most high schools, or directly from the Educational Testing Service, Princeton, New Jersey.

Credit by Examination. Students who can show reasonable cause to believe that they have mastered the basic courses in economics, calculus, general chemistry, psychology, or sociology and who wish to get credit by examination for these, should state their case to the department chairman. If he is convinced, he will so inform the Counseling and Testing Center. The student applies to the center, pays the fee (currently \$5.00) and takes the corresponding subject examination under the College Level Examination Program. A satisfactory score on these subject examinations, as determined by the appropriate department, yields course credit.

For other courses the examinations have to be specially prepared by University faculty members, and so the requirements to take them are somewhat more stringent. An enrolled student with a grade-point average of 2.4 or better who presents evidence to his college dean that he has had the equivalent of a course through experience or training but has not received college credit for the course, may apply for credit by examination. (See preceding section for foreign languages.) Graduate students may also obtain credit in this manner for certain undergraduate courses. A \$5.00 fee is charged for each examination.

In each case the examination must be prepared under the auspices of the department concerned, must be more comprehensive than the usual "final examination" and must be designed to serve as the scholastic equivalent of the course.

Courses passed by examination do not carry grade points.

ACADEMIC PROBATION, SUSPENSION, DISMISSAL

If a student fails to meet the minimum scholastic requirements of the University, he is put on probation, suspended or dismissed. For purposes of measuring this minimum requirement, the grade-point ratio (GPR) is used.

Probation. A student is placed on academic probation at the end of any semester in which his cumulative GPR falls below 2.0. The probationary student continues work at the University, but he must achieve a GPR in the probationary semester of at least 2.0 to be allowed further registration.

Regulations governing academic probation will be applied at the end of each semester.

Suspension. A student who has been denied continuing registration for the first time is placed on academic suspension. A student will be suspended if, even though he is not on probation, he has failed, after taking 24 credits, to achieve a cumulative GPR of at least 1.7. A student will also be suspended if he is on academic probation at this University and has not maintained a GPR of at least 2.0 in the work of the probationary period.

Regulations governing academic suspension are applied at the end of each semester.

A suspended student is eligible to return to the University after he has remained out of the University for at least one semester (not including summer session). However, a student suspended at the end of the spring semester is permitted to attend the summer session immediately following his suspension. If he brings his cumulative GPR up to 2.0, the Committee on Admissions and Academic Standing has the option of setting aside the suspension period and allowing the student to enroll in the fall semester.

Dismissal. A student is dismissed (1) when he has been previously suspended and has failed on readmittance to maintain a GPR of at least 2.0 in his initial semester, or (2) when he is admitted on academic probation and fails to meet academic requirements during the probationary period. Such students will be readmitted only in unusual circumstances. Regulations governing academic dismissal are applied at the end of each semester.

Applications for Return from Suspension or Dismissal. Applications for return from suspension should be filed at the office of admissions and records by July 1 for the fall semester, by December 1 for the spring semester, and by April 1 for the summer session. The same deadlines apply for applications to return after dismissal, except that these applications should be filed at the student services office of the appropriate college.

Other Provisions. Warnings of low scholarship are given to the student approximately at mid-semester, but the student should not assume that his work is passing merely because he has not been warned. The University is not responsible if a warning mailed to a student fails to reach him.

Ordinarily, failure in the first semester of a year course bars a student from registering for the second semester of that course. However, there are a number of exceptions to this, wholly at the discretion of the individual departments. A department may choose to withhold credit from a student registered illegally in such a course.

Upon finding that a student is suffering from a physical or mental condition detrimental to the student or the University, the vice-president for student affairs will, on medical advice, recommend proper action to the appropriate college dean. The dean may then request that the student be withdrawn officially, without prejudice or academic penalty. Readmission is contingent upon review and recommendation by the college dean and the vice-president for student affairs.

Degree Programs

PROGRAMS LEADING TO ADVANCED DEGREES

At the graduate level, the University currently offers curricula leading to the Master's degree in 69 areas (including Arts, Science, Fine Arts, Business Administration, Education, Public Health, Library Studies and Social Work). Doctoral programs leading to the Ph.D. are presented in 28 fields. Post-graduate studies have been established in some of the sciences and medical arts. For information on these programs, and the five-year diploma curriculum in education, see "College of Education," and the annual *Bulletin* of the Graduate Division.

PROGRAMS LEADING TO THE BACHELOR'S DEGREE

Purposes of Undergraduate Instruction

Students come to American universities with many interests and motivations, both cultural and vocational. The University of Hawaii attempts to respond to as many of these interests as seem appropriate to an institution of higher education. Thus, it currently provides six different undergraduate degrees (bachelors of Arts, Fine Arts, Science, Business Administration, Education, Music) in a total of 65 academic fields, plus an experimental program which offers individual students an opportunity to design their own interdisciplinary field of concentration instead of a major.

The primary purpose of each undergraduate curriculum is intellectual—to educate students to think for themselves: to analyze, to apply appropriate standards, to arrive at their own judgments. In the process, students should gain knowledge and sharpen their ability to communicate, both in standard prose and in the symbolism of mathematics, logic and the arts.

Generations of students have discovered, though sometimes only after graduation, that there is no real conflict between the goals of liberal or general education set forth by a university and their individual career goals. There is no surer preparation for professional life and participation in society than an education which enhances the ability of the individual to keep learning all his life and to communicate effectively with his fellow men, and such are the overall purposes of general education at the University of Hawaii.

Secondly, each undergraduate curriculum tries to lead the student to sufficient depth in a field of learning so that he can understand its central concepts, some of its methodology in examining problems, the standards of truth, value and relevance which it employs. Seldom in the contemporary world does the bachelor's degree signify that the student is ready to practice the art or science which he has been studying. (There are a few exceptions, such as nursing.) Usually the baccalaureate shows that the student is ready for specialized training in a field, either by graduate study or by work on the job, and that he has attained a general education illuminated by some beginning work in a particular field.

Undergraduate Degrees Awarded:

1. By the College of Arts and Sciences: bachelor of arts (B.A.), of fine arts (B.F.A.), of music (B.Mus.), bachelor of science (B.S.).
2. By the colleges of Tropical Agriculture, Engineering, or Health Sciences: bachelor of science (B.S.); the diploma designates the particular program of study completed.
3. By the College of Education: bachelor of education (B.Ed.), except in the recreation leadership program, where a bachelor of science (B.S.) is granted. Holders of bachelor's degrees who complete the five-year program in education receive a diploma certifying that.
4. By the College of Business Administration: bachelor of business administration (B.B.A.).
5. By the School of Nursing (in addition to baccalaureate program): Associate of Science (A.S.) for completion of two-year program in practical nursing.

University Requirements for Bachelor's Degrees

The liberal education objectives of undergraduate learning include an understanding of the fundamentals of major fields of knowledge which should be the common possession of educated men and women, whatever their specialized interest. This objective is not likely to be attained from a random arrangement of courses. Consequently, a program of liberal or general education is required of all students seeking a baccalaureate from the University. The general education "core," as it is frequently called, amounts to about a third of a four-year curriculum. It tries to assure for each student reasonable competence in organizing his thoughts in written and spoken English—and in understanding the expressions of others—in mathematics, in the humanities, natural sciences and social sciences.

The "core" need not be completed during the first two years, though general education courses are frequently concentrated in the freshman and sophomore terms. General education requirements can be met either by completing appropriate courses—listed below—or by passing comprehensive examinations. (See "Credit by Examination.")

To qualify for any baccalaureate degree from the University of Hawaii, a student must satisfactorily complete: (1) the general education requirements of the University outlined immediately below; (2) at least 60 additional credit hours of non-introductory courses (i.e., those numbered 200 and above); and (3) the requirements of his college (which may overlap these University requirements).

Curricular Requirements. A program of study to accomplish the purposes of undergraduate instruction is worked out with each student within the college in which he registers. Curriculum requirements vary considerably from college to college. However, all students intending to receive a baccalaureate from the University are required to take courses, or by examination demonstrate their competence, in the following fields. (The courses indicated are intended to provide liberal education, rather than specialized training; the number of courses from which a choice is made by the students to satisfy core requirements is increased from year to year.)

Communications: Each student must have competence in expository writing and oral communication appropriate for study at an institution of higher learning. The usual means of fulfilling this requirement is to pass English 100 and Speech-Communication 101* or 145. Students who have this competence when entering the University may demonstrate it—and receive credit for the equivalent courses—by passing an examination.

Quantitative Reasoning: Ability to apply, understand or appreciate the uses of mathematics, or its philosophical base, is demonstrated by passing any mathematics course at the university level or Philosophy 210, symbolic logic, or by passing examinations equivalent to such courses.

World Civilizations: Adequate comprehension of the broad sweep of cultural development is *usually* demonstrated by passing History 151 and 152 World Civilization (or its counterpart in the Honors Program, 161-162, or its upper-division equivalent, 351 and 352). *However*, with the concurrence of their academic advisers, students with an adequate understanding of Western civilizations may complete the requirement by passing courses in the history of Asia, such as History 241 and 242, or in Asian Studies, such as 301-302. *Conversely*, students with a satisfactory comprehension of Eastern civilizations may fulfill the requirement by taking one or more courses in European or American history, such as 281 and 282, 401 and 402, 405 and 406, or American Studies 485 and 486.

*Note: The College of Arts and Sciences does not include this course in its general education options.

Humanities: The educational objective sought here is to develop standards of value and beauty, to sharpen critical judgment by the study of literature and the other creative arts, of philosophy and religion. To fulfill this requirement, students must pass at least 3 semester courses, distributed among 2 or more of the following 3 groups:

I: English 251, 252, 253, 254, 255, 256; Drama 160; literature courses offered by the language departments (in original language or in translation).

II: Philosophy 100, 200; Religion 150, 151.

III: American Studies 201, 202;* Art 101, 270, 280; Interdisciplinary Studies 131, 133; Music 160, 170, 180, 265, 266.

Natural Sciences: Sought here is a critical understanding of natural phenomena and of the methods of science used in their study. The requirement may be fulfilled by passing at least 3 semester courses, chosen from the following, and preferably including both the biological and physical sciences.

Chemistry 113 and 115, 114 and 116, 117 and 118 (each combination of lecture and lab is here considered one course); Geography 101; Geosciences 101, 102.

Oceanography 201; Physics 100, 110, 111, 160, 161, 170, 264, 272, 274. Biology 220; Botany 101, 201, 450; Genetics 451; Microbiology 130, 351; Zoology 101, 450.

General Science 121, 122; Information Sciences 301, 302.

Social Sciences: The purposes of this requirement are (1) to seek an understanding of the extent to which scientific method can be used in studying human behavior and institutions and (2) to assist students in assessing their own behavior in society. The requirement may be fulfilled by passing at least 3 semester courses, including at least one semester course from each of the following groups:

I: American Studies 201, 202;* Anthropology 150, 200; Psychology 100, 110, 112, 320, 321, 322, 430; Social Sciences 301, 302; Sociology 151, 201, 360.

II: Economics 120, 150, 151; Geography 102, 151; Political Science 110.

These general education requirements were adopted in 1966 and are required of undergraduate students entering the University, or becoming classified undergraduates, after June 1, 1966. Students who registered as classified undergraduates before that date may elect to complete their baccalaureate programs either under the newer requirements or those in effect before 1966.

*Satisfies either Humanities or Social Sciences distributional requirement, not both.

Credit and Grade-Point Requirements. Minimum credit requirements for baccalaureate degrees are set by each college offering them. In addition, the student must have earned at least twice as many grade points as his total registered credits, i.e., have a C average.

Residence Requirements. Baccalaureate degrees are granted only those students who earn a minimum of 30 semester hours in residence (that is, taking credit courses or their equivalent by examination) at the University of Hawaii.

Degree candidates must be registered and in attendance during the semester or summer session in which the degree is to be granted. A college dean may modify this requirement, in exceptional cases, by granting a leave of absence.

Time Within Which Work Must Be Completed. The normal expectation is that students will complete their academic work in a ten-year period. Credits earned more than ten years before graduation in courses which have materially changed content or standards will be denied.

Application for Degree. An application for graduation must be filed at the admissions and records office, Bachman Hall 125, a semester, preferably a year, prior to graduation.

Special Instructional Programs

HONORS PROGRAMS

Selected Studies (lower division). The Selected Studies Program provides a group of academically promising freshmen and sophomores with an opportunity to use the University's facilities and resources more fully than usual. Each student has a faculty adviser to assist him to plan his curriculum and within certain limits to tailor it to his special interests and abilities. Special courses are available in history, in the physical and the social sciences, in the humanities, etc.; moreover, there are special sections reserved in basic freshman and sophomore courses in economics, English, languages, mathematics, music, philosophy, political science and other subjects.

Admission to the program is by invitation to freshmen and sophomores whose high school records and aptitude test scores, or whose recommendations from University faculty, indicate they have the qualities needed to profit from the opportunity.

Honors (upper division). Honors degrees may be granted only to participants in the University Honors Program. Successful completion of a program of honors work in the upperclass years entitles the student to a bachelor's degree with "honors," "high honors" or "highest honors." Application for admission to the program may be made by any regularly registered undergraduate at the end of his sophomore year or during his junior year.

During the junior year the nature of honors work is determined chiefly by the University department or curriculum in which the student is enrolled as a major. In the second half of his junior year and the first half of his senior year he participates in an interdisciplinary colloquium. In his senior year, with the guidance of a specialist in his field, he pursues a program of independent research that culminates in a senior thesis.

Full information about both programs may be obtained from the Coordinator of Undergraduate Honors Programs in Sinclair Library.

Academic Commendation. Seniors who have a grade-point ratio of 3.4 or above but who have not completed the Honors Program will receive their degree "with academic commendation." At least 60 semester hours of this undergraduate work must have been taken at the University of Hawaii within six years prior to graduation.

Honors Program Courses

*See pp. 4-5 for a discussion of course descriptions.
(HON: courses limited to Honors students)*

HON 151-152 Science and Ideas (4-4) I, II **Kay**
Man's present understanding of nature and foundations upon which that understanding is based. Honors equivalent of Sci 121-122.

HON 317-318 Junior Honors Seminar (1-1) Yr. **Linn**
Survey of research areas, specialized reading and preliminary experimentation; definition of a specific research problem. Available only in selected fields.

HON 491-492 Honors Colloquium (3-3) Yr. **Seifert**
Weekly meetings for discussion of enduring issues and problems which are of interdisciplinary nature. Required of, and limited to, candidates for bachelor's degree with honors.

HON 493-494 Senior Honors Thesis (2-2) Yr. **Linn**
Preparation of research paper under individual faculty supervision. Required for graduation with honors.

HON 499 Interdisciplinary Tutorial (3) I, II **Linn**
Readings from a variety of disciplines. Consent of tutor and honors coordinator. Limited to seniors.

(SS: Special Studies courses; open to all students; asterisk indicates that Honors and SSP students are given preference.)

SS 101-102 The College Experience Seminars (2-2) Yr. **Arkoff**
Student-led seminars to explore purposes, processes and problems of higher education, and to give students perspective on their own college careers. Student participants enroll in SS 101, student leaders in SS 401.

***SS 131 Man and the Arts (4) I**
Introduction to non-verbal arts as they direct and embody man's awareness. Fulfills Humanities Area Requirements.

***SS 133 Man and His City (3) I, II**
The 20th-century American city as an expression of attitude and value. Examination of Honolulu as example of various theories of function of the city. Fulfills Humanities Area Requirements.

***SS 171-172 Problems of Human Society (4-4) I, II**
Intensive investigation of selected processes and issues of contemporary society through perspectives and resources of the social sciences. Field work, tutorials, group discussion, lectures. Honors equivalent of SocSc 301-302.

SS 221-222 International Agriculture (1-1), I, II **S. Goto**
Colloquium on role of agriculture in community development, with special emphasis on Pacific and S.E. Asia. May be repeated.

***SS 251 The Image of Man (3) I, II** **Neogy**
Attempt to understand essentials of the human condition as revealed in processes and values, in interaction between myth and history. Fulfills Humanities Area Requirements.

***SS 291 Community Service Practicum (3) I, II** **Blaylock**
Supervised field work in selected community agencies; seminar in corresponding social problems. Pre: consent of instructor after interview.

SS 321-322 Seminar in International Agriculture (1-1), I, II **S. Goto**
Continuation of SS 221-222 with emphasis upon leadership problems.

SS 355 Seminar in Symposium Topics (3) I, II
Supervised study in preparation of ASUH symposia.

- SS 401 The College Experience Seminars (2) I, II** **Arkoff**
 Faculty-led seminars for student leaders of SS 101 groups. May be repeated. Pre: consent of instructor.

INTERDISCIPLINARY STUDIES (IS)

- IS 231 The Hero in the New World (4) II** **Gurian**
 Interdisciplinary study of the impact of imported attitudes, values, world views, and esthetics on native Western hemisphere cultures particularly as expressed in conceptions of the Hero. From 15th-century to the present.

Special Studies courses such as *Seminar in Cooperative General Education, Contemporary Vietnam*, etc. numbered -97 -98 will be taught only during the semester for which they are approved. Watch for announcements.

Interdisciplinary Studies

In addition to the many interdisciplinary courses listed among the offerings of the departments of the several colleges in the following pages, there are a few such courses which do not fit within any department. Among the latter are:

- IS 300 Field Study (arr.) I, II**
 Pre-arranged systematic investigation in the field of selected topics. Primarily for East-West grantees. Pre: permission of appropriate department chairman and dean.

- IS 600 Theory of Administration (3) I, II** **Buchele**
 This course is offered for students in Business Administration, Political Science, Social Welfare, Educational Administration, Public Health Administration and possibly other programs. Students should consult advisers in their own departments for information on how this course may fit into their curricula. While the course is taught primarily by the professor listed, faculty members from each of these departments participate.

Critical review of key current and classic writings in the theory and practice of administration; development of a comprehensive, integrated understanding of the nature of administration.

- IS 700 Seminar in College and College Teaching (3) I, II** **Staff**
 Thought and research concerning college and college teaching. Current issues, problems, and developments in higher education. Limited enrollment; pre-registration requested.

(For a brief description of the courses listed below by title only, see preceding section under Honors Program. However, only those marked "Hon" are necessarily limited to students in Honors Programs.)

(HON: courses limited to Honors students)

- HON 151-151 Science and Ideas (4-4), I, II**
HON 317-318 Junior Honors Seminar (1-1) Yr.
HON 491-492 Honors Colloquium (3-3) Yr.
HON 493-494 Senior Honors Thesis (2-2) Yr.
HON 499 Interdisciplinary Tutorial (3) I, II

(SS: Special Studies courses; open to all students; asterisk indicates that Honors and SSP students are given preference.)

- SS 101-102 The College Experience Seminars (2-2) Yr.**
***SS 131 Man and the Arts (4) I**

SPECIAL PROGRAMS

- *SS 133 Man and His City (3) II**
- *SS 171-172 Problems of Human Society (4-4) I, II**
- SS 221-222 International Agriculture (1-1) I, II**
- *SS 251 The Image of Man (3) I, II**
- *SS 291 Community Service Practicum (3) I, II**
- SS 321-322 Seminar in International Agriculture (1-1) I, II**
- SS 355 Seminar in Symposium Topics (3) I, II**
- SS 401 The College Experience Seminars (2) I, II**

INTERDISCIPLINARY STUDIES (IS)

- IS 231 The Hero in the New World (4) II**

The Non-Major B.A. Program

In this period of rapid growth at the University, some students have come to feel regimented by the standardized curricular requirements of the school, or neglected as individuals in a large student body. As a partial response, the University has instituted an experimental Non-Major B.A. Program, generally referred to as "the Non-Major Major Program," which leads to a bachelor of arts degree in liberal studies from the College of Arts and Sciences.

This program, established in September, 1968, and currently administered by the Honors Program, permits qualified undergraduates to construct their own multidisciplinary major-equivalents with the advice and consent of the Program Coordinator and a faculty member of their choice. At present, students in the Program must satisfy the University degree requirements, the Arts and Sciences credit requirements, and the Arts and Sciences language requirement. Also, they must maintain a 2.5 grade-point ratio in those courses which form their major-equivalent.

Any student not on academic probation may apply for admission to the Program by contacting the Undergraduate Honors Program Office in Sinclair Library. While it is not necessary to be in Honors for acceptance in the Non-Major Program, students may elect to be in both. Essentially, the Non-Major Program has been designed for students who: (1) wish to study a particular problem or theme, e.g., revolution, the urban crisis, through a multidisciplinary constellation of courses; (2) are unsure about their ultimate career goals and prefer to take a broadly based liberal-arts program; and (3) wish to create for themselves an undergraduate major or program for which there are courses—e.g., Linguistics, American Studies, Hawaiian Studies—but for which a baccalaureate program has not yet been established. Thus, the main advantage of the Non-Major Program is that it opens new options to undergraduates by allowing them to tailor their bachelor's curriculum to their individual interests and needs.

Residential Learning Project

Freshmen students may apply for participation in a co-educational program of instruction conducted in Johnson Residence Hall. The program includes some of the courses offered in the University's general education core, plus academic advising and co-curricular activities. Approximately 200 students plus six faculty members, who have offices in the project, form the community. Persons interested in learning more about the project should inquire at the College of Arts and Sciences, Office of the Associate Dean for Student Services, Bachman Annex 10.

English Language Institute

For ELI course descriptions see "College of Arts and Sciences."

The University of Hawaii has established the English Language Institute (ELI) as its agency for assuring that the English proficiency of its foreign students is adequate for University coursework. ELI responsibilities include testing and evaluating the English of all new foreign students, and providing suitable instruction for those students whose English fails to meet standards determined by the University to be sufficient for the pursuit of full-time studies.

Testing and Evaluation. Upon arrival at the University, all foreign students are referred to ELI for evaluation of their English proficiency. Registration for University coursework is not permitted until this evaluation has been made.

Exemption from ELI. Following ELI's evaluation of their English proficiency, the following foreign students are exempted from ELI training: (a) those whose native language is English; (b) those who hold a bachelor's or master's degree from an accredited university in the United States, Australia, Canada, England, New Zealand or any other country in which the *principal* language is English; (c) those whose English meets the University's standards for full-time study.

Assignment to ELI Courses. All foreign students not exempted on the basis of their entrance proficiency testing are assigned to an appropriate program of ELI instruction, except that foreign *graduate students* who can demonstrate that they have had all of their university work (with the exception of foreign languages) in English may, in counsel with their advisers, waive any or all ELI recommendations for course work. Because of their special purpose, ELI courses take precedence over all other course work. They may not be postponed to a subsequent semester, nor may they be dropped or taken with auditor status. Students who fail to comply with ELI assignments may be denied further registration at the University.

SPECIAL PROGRAMS

Relationship of ELI Assignments to Other Coursework. Students assigned to ELI training take a reduced academic load, in order to devote sufficient attention to gaining satisfactory English competence. Students required to take relatively large amounts of ELI work during their first and second semesters must expect to make proportionately slower progress in their regular University studies. This is an especially important factor in some graduate programs, and should be carefully considered by all foreign students whose time or financial support is limited.

Eligibility for Registration in ELI. Registration for ELI courses is limited to students who have been officially admitted to the University. Students who apply to the University for the sole purpose of entering ELI in order to improve their English will not be accepted.

Reserve Officers Training Corps

For course descriptions see "College of Arts and Sciences" where "Aerospace Studies" and "Military Science" are listed in alphabetical order.

Army and Air Force ROTC units at the University offer programs leading to regular or reserve commissions in the U.S. Army and Air Force upon completion of the baccalaureate degree requirements.

Military Science (MS)

The *four-year program* is a voluntary program consisting of on-campus training during four semesters of freshman (MS I) and sophomore (MS II) years and is referred to as the basic course. Students who have participated in Junior Division ROTC or who have had active military service of more than four months may be exempt from a portion or all of the basic course. The advanced course consists of on-campus training throughout the junior (MS III) and senior (MS IV) years, plus a six-week summer camp between the junior and senior years at a mainland military installation. Subsistence pay of \$50.00 per month is paid to students in the advanced course during the school year, and pay for the summer camp is at the rate of \$170 per month. Training in the advanced course is selective, and successful completion of the training leads to a regular or reserve commission as a second lieutenant in the U.S. Army. To be eligible for the advanced training under the four-year program a student must: (1) be a citizen of the United States; (2) be selected for the advanced course under procedures prescribed by the professor of military science; (3) successfully complete the first two years (basic course) of a Senior Reserve Officers Training Corps course or the equivalent, as explained above.

The *two-year program* is essentially the same as above except that credit for the two-year basic course is gained by attendance and successful completion of a six-week summer camp at a mainland military installation prior to entry into the advanced course. Students interested in this program must have four semesters of college work remaining after completion of the summer camp and must apply for selection early in the spring semester of the year in which they plan to attend the basic summer camp. Pay for the summer camp is at the rate of \$103 per month.

The Army Flight Training program is offered to qualified students in their senior year of the ROTC program.

Financial assistance scholarships are available on both a four-year and a two-year basis. The scholarships provide payment for tuition fees, cost of books, laboratory expenses and \$50.00 per month subsistence pay for the period of the scholarship. Applicants for the four-year scholarship normally apply during their senior year in high school. Applicants for the two-year scholarships apply during the second semester of their sophomore year at the University. Completion of the basic course is a prerequisite for the receipt of the two-year scholarship. For further information, inquire at the department of military science.

Aerospace Studies (AS)

The Air Force ROTC prepares selected college students for duty as professional Air Force officers. Recent far-reaching changes in teaching techniques, in curriculum, and in leadership development will better prepare young men for the challenge ahead. Upon successful completion of the program and receipt of a degree, the student will be commissioned as a second lieutenant in the U.S. Air Force. Graduates will then either enter active duty or pursue an advanced degree in an "educational delay" status, should they so choose.

The AFROTC program at the University of Hawaii, referred to as the Professional Officer's Course (POC), is a voluntary two-year program. Applicants receive general military training during a six-week course at an Air Force base prior to their junior year. Once enrolled, students study aviation history, space operations and Air Force leadership and management in an interesting academically free student centered atmosphere. Senior cadets, who qualify as pilot candidates, will receive up to 36 hours of flying time which can be applied toward a private pilot's license.

All cadets accepted for the Professional Officer's Course receive \$50 per month stipend and in addition are paid while attending summer field training. Financial assistance scholarships are available for qualified cadets who have had the first two years of a four year ROTC program, either Army or Air Force. This scholarship consists of tuition, fees, books, plus \$50 per month. Competitive examinations will be used to select these students. Interested students should contact the professor of aerospace studies early in their sophomore year.

Russian Area Studies Certificate

A certificate in Russian Studies, signifying the completion of certain requirements in addition to a regular major, is offered by the Committee on Russian Studies of the University of Hawaii.

The certificate is awarded upon graduation to a student who completes (1) advanced reading and conversation courses in the Russian language equivalent to at least third-year Russian and (2) 9 credits of work, exclusive of courses taken as part of the major, chosen from the offerings listed below.

- Geography 345 Geography of the Soviet Union (3)
- History 449-450 History of Russia (3-3)
- History 451-452 Modern Russia and Soviet Foreign Policy (3-3)
- History 453-454 Russian Intellectual History (3-3)
- History 497 Senior Tutorial in Russian History and
 Historiography (3)
- History 5457 The Russian Revolution (3)
- Philosophy 400 Political Philosophy (3)
- Russian Literature 400 Contemporary Literature in Translation (3)
- Russian Literature 402 19th Century Russian Literature in
 Translation (3)
- Russian Literature 411-412 Literature of the 19th Century (3-3)
- Russian Literature 413-414 Literature of the 20th Century (3-3)
- Russian Literature 415 Russian Poetry (3)
- Russian Literature 417 Russian Drama (3)
- Russian Literature 431-432 Contemporary Soviet Russia through the
 Eyes of Soviet Literature (3-3)
- Religion 480-481 Russian Religion (3-3)

Further information can be obtained from Professor Rex A. Wade, Committee on Russian Studies, Crawford 101, ext. 8879.

Tutoring and Services to Handicapped

A tutoring service, called *Kokua*, is maintained by the University to assist undergraduate students who need special, but temporary, assistance in a particular subject. Normally, students are referred to *Kokua* by an academic adviser or by an instructor. Self-referrals are also accepted.

Students who will need special assistance because of physical handicaps should apply, as early as possible, to the *Kokua* office. *Kokua* provides student aides, help with registration, readers for the blind and other help to students who need special assistance in order to attend classes.



College of Arts and Sciences

THE PROGRAMS OF THE COLLEGE OF ARTS AND SCIENCES are designed in the conviction that liberally educated persons must have a comprehensive knowledge of the major fields of learning—a general education—and an intensive knowledge of a particular field of the humanities, the social sciences, or the natural sciences.

In general education the College seeks to develop in students:

- an appreciation of our diverse cultural heritage and its relevance to modern life,
- criteria for the assessment of values in different kinds of society and the world community,
- aesthetic standards,
- a knowledge of themselves and their environment from a humanistic and scientific point of view,
- the ability to make sound judgments on disputed matters,
- an understanding of the interdependence of general and specialized education,
- a desire for continuing intellectual growth.

After a year or two of general education, a student undertakes a program of study offered by the College in a major field of concentration in the humanities, the social sciences, or the natural sciences; or he transfers to a program of another college of the University—e.g., Health Sciences or Education.

Because of its geographical position midway between continental America and Asia, the College is unusually conscious of the importance of the Far East; unique opportunities are provided for the study of the history, languages, literature, art, institutions and philosophies of the countries and peoples of this area.

ADMISSION AND DEGREE REQUIREMENTS

Admission requirements for the College are the same as those for the University (pp. 39-44). However, candidates for admission are strongly advised, although not required, to offer a minimum of two years of college preparatory mathematics and three years of a foreign language.

To be entitled to a bachelor's degree offered by the College, a student must:

1. complete certain basic subjects specified by his degree program,
2. fulfill the prescribed requirements of a major field of concentration,
3. offer at least 60 semester hours of credit in other than introductory courses,
4. acquire an aggregate of 124 semester hours of credit, of which no more than 20 hours is acceptable in subjects not offered within the College,
5. earn at least a 2.0 grade-point ratio (*C* average) for all registered credits, and in the major field,
6. submit, during the semester preceding the award of the degree, two copies of an application for graduation, one to the office of admissions and records, and one to the office of student services,
7. pay a graduation fee of \$5.00 to the treasury office.

No course will satisfy more than one kind of requirement.

Exemption by examination is possible in expository writing, speech-communication, and foreign language by applying to the appropriate departments. The speech-communication requirement is waived for students who have a one year course in high school in extemporaneous public speaking or debate with a grade of *B* or better. Credit by examination can be obtained in any course offered in the College which is required in a student's curriculum; it carries a corresponding reduction in the 124 hours required for graduation.

The dean of the College may exercise his discretion in modifying some of these requirements in exceptional cases after consultation with the graduation committee.

CURRICULA

Each program leading to the bachelor's degree is built around a major field of concentration—the major—which consists of a specific number of credits and required courses in a particular field or discipline, together with related courses (usually upper division) in other subjects which are associated with and contribute to that discipline.

The major must be indicated by the end of the sophomore year. For certain preprofessional programs, such as prearchitecture, predentistry,

premedicine, and prepharmacy, and for the bachelor of fine arts, bachelor of music, and bachelor of science degree programs, it should be indicated at the beginning of the first year.

Students seeking baccalaureate degrees in medical technology, professional nursing, or education must complete the entrance requirements of the program they wish to enter and transfer, ordinarily as juniors, to the College of Health Sciences and Social Welfare, or the College of Education. To be eligible for admission to any of these programs, a student must generally have completed a minimum of 60 credit hours of study, including the general education requirements of the University (pp. 53-56) and certain specified courses.

ACADEMIC ADVISING

Assistance in planning academic goals and curricula, and help and advice on a wide range of general or personal problems are available at the student services office of the College. Advisers are faculty members specially trained and oriented to assist students in selecting and achieving their academic goals.

The service mentioned above applies to freshmen and sophomores. When the student has completed 55 credits (junior standing), he is required to select a major field, at which time his records are transferred to his major department and he is assigned an adviser from that department's faculty. In addition to their departmental adviser, juniors and seniors may still call on the student services office for any special assistance, and seniors should report to student services for a final check of their records.

BACHELOR OF ARTS DEGREE PROGRAM

Basic Requirements

Completion of the University curricular requirements in communications, quantitative reasoning, and world civilizations. In addition, the following are required: health and physical education, one activity course; foreign language, intermediate year.

The University requirements in communications are required courses for the freshman year. Except in very unusual circumstances, students are not permitted to drop any of these courses.

Area Requirements

HUMANITIES: 18 semester hours, including at least two English courses from Group I, at least one course from Group II, and at least one course from Group III.

I. (Identical with University Group I)

II. (Identical with University Group II)

III. (Identical with University Group III)

IV. American Studies 485, 486; Art 105, 106, 107, 108, 471; Asian Studies 301, 302; Drama 240, 260; English 312 to 499 (not including 397, 398, 497, 498); History 241, 242, 281, 282; Journalism 150; Linguistics 102; Speech Communications 211, 231, 304, 305, 406.

NATURAL SCIENCES: Completion of the University curricular requirements in Natural Sciences.

SOCIAL SCIENCES: Completion of the University curricular requirements in Social Sciences, plus one additional course chosen from the University list.

Majors (B.A. Degree)

The following list indicates the major fields of concentration available to students and the requirements of each, viz., the number of semester hours and required courses (generally not to exceed 40 credits in any one subject), as well as required related courses.

ANTHROPOLOGY. *Major requirement:* 21 semester hours. *Required courses:* 150, 200, 210, 220, 230, and any two courses numbered above 230.

ART. *Major requirement:* 39 semester hours. *Required courses:* Art 101, 12 hours of introductory studio, 12 hours of art history, and 12 hours of emphasis in drawing and printmaking, painting, weaving and textiles, ceramics, sculpture, visual design or art history. Approved by College of Education for art education majors.

ASIAN STUDIES. *Major requirement:* 36 semester hours. *Required courses:* 301-302; 303-304 (taken concurrently with 301-302); 6 hours of a third-year Asian language or equivalent; one of two alternative choices: (1) 15 hours from one of the following fields: anthropology, art, Asian literature, economics, geography, history, philosophy, political science, religion, sociology; plus 6 hours of Asian courses outside this field of concentration from the humanities and social sciences, or (2) 15 hours of courses on one Asian country or region plus 6 hours of courses from another Asian country or region.

BIOLOGY. *Major requirements:* 30 semester hours including Biol 220 and Biol 250; Genetics 451 or Micro 475; Bot 470 or Zool 330, 430 or Micro 431; Bot 353 or Zool 401 or Bot 454 or Micro 480. Chemistry 243-246; Physics 160-161 or 170-275; and Math 205-206 are also required. Additional non-introductory courses are to be selected from biochemistry, botany, genetics, microbiology or zoology. Students tentatively planning to major in Biology should consult with the Director, Curriculum in Biology, immediately on entering the University of Hawaii.

BOTANY. *Major requirements:* 32 semester hours including not more than 4 credits in courses below 200. *Required courses:* 201, Biol 220, Biol 250 or equivalents; at least 15 semester hours in courses numbered above 300. Credit toward major will be granted for Genetics 451-452. *Related courses required:* Chemistry 113-116 or 117-118, and 243-246; Mathematics 134 and 205. Students planning a career in Botany beyond the B.A. degree are advised to take one year of physics and calculus. **HONORS PROGRAM.** Requirements as for the ordinary degree with the addition of Physics 160-161 or Physics 170-171; Mathematics 206.

CHEMISTRY. *Major requirement:* 24 semester hours, in addition to 114-116 or 117-118; including 133-134, 243-245, 244-246, 333, 351, 352, 353. A reading knowledge of scientific German, French, or Russian is required.

CHINESE. *Major requirement:* 30 semester hours above the intermediate level.

CLASSICS. *Major requirement:* 24 semester hours in upper-division Latin and Greek courses.

DRAMA AND THEATRE. The department views theatre not only as a craft, but as an art form which provides arresting statements of significant human experience. The student is therefore expected to have an interest in and some familiarity with literature and the arts, and to gain understanding of the relation of the theatre to other intellectual and creative activities.

Students considering a major should consult a departmental adviser at their earliest opportunity. Freshmen will do well to take History 151-152 and to start on a foreign language. These courses from the Area Requirements (p. 55) are strongly recommended, for completion, where possible, by the beginning of the junior year: Art 101, Drama 160 (lab 1), Drama 260, Music 160 or 170, Philosophy 200.

Major requirement: 24 semester hours, including drama courses. Must include a semester each of acting, technical theatre, history of the theatre and directing. In addition to drama courses, 6 hours of dramatic literature are required. Majors should acquire a working knowledge of the theatre through production experience in scenery, lighting, costumes and acting, and take on a major production responsibility in at least one of these areas.

ECONOMICS. *Major requirement:* 24 semester hours of upper division courses. *Required courses:* 150-151, 300, 301, 321, 340.

ENGLISH. *Major requirement:* 27 semester hours of upper division courses. *Required courses:* 9 hours in "periods" of English literature, 6 hours in single authors, 3 hours in American literature, 6 hours in the English language, writing, and criticism, and 3 hours in a genre.

FRENCH. *Major requirement:* 30 semester hours, exclusive of 101–102, 201–202, 301, 331–332, and 361 prerequisite to courses numbered 400 and above.

GEOGRAPHY. *Major requirement:* 25 semester hours. *Required courses:* 101, 151, 300, 370 or 375, 390, a 300 level regional course and 3 additional courses in systematic physical or cultural geography (all three preferably from one grouping or the other). *Related courses required:* 9 non-introductory credits in a related field(s) approved by the department. All majors are advised to take a course in statistical methods (Geography 380, or the equivalent). In choosing courses under the College area requirements, students are advised to select Anthropology 200 and Economics 151 under the Social Sciences options, Mathematics 134 and 201 or 205 under the Basic Requirements or Natural Sciences options, and basic courses in Physics (160–161), chemistry, biology, or geosciences under the Natural Sciences options.

GEOLOGY. *Major requirement:* 24 semester hours beyond 101–102, and including 300, 305, and 410. As related courses, 16 hours chosen from chemistry, physics and/or biology. The foreign language should be French, German, or Russian.

GERMAN. *Major requirement:* 30 semester hours of courses numbered 300 and above. 203 may count toward major.

GREEK. *Major requirement:* 24 semester hours exclusive of 201–202. *Required courses:* Latin 101–102.

HISTORY. *Major requirement:* 28 semester hours of upper-division courses. *Required courses:* 497 and 12 hours from one of the three fields (United States, Pacific and Asia, Europe). Honors program students take 493-494 instead of 497.

JAPANESE. *Major requirement:* 30 semester hours above the intermediate language level.

JOURNALISM. *Major requirement:* 45 semester hours. *Required courses:* 205, 206, 239, 315, 316, 385; in addition to the college area requirements, 6 credit hours in the humanities department, 6 in the social sciences, and 15 credits in a department of choice.

LATIN. *Major requirement:* 24 semester hours exclusive of 201–202. *Required courses:* Greek 101–102; Latin 301–302.

MATHEMATICS. *Major requirement:* 33 semester hours. *Required courses:* 15 semester hours in courses numbered above 300.

MICROBIOLOGY. *Major requirement:* 24 semester hours. *Required courses:* 351 and three of the following: 431, 461, 463, 475, 480, 490. Additional work to consist of an integrated group of courses selected from

appropriate offerings in biochemistry, biology, botany, chemistry, genetics, microbiology, and zoology. As related courses, Chemistry 133-134 or 351; Mathematics 206; and Physics 160-161 or 170-173.

MUSIC. *Major requirement:* 38 semester hours. *Required courses:* 181-182, 183-184, 265-266, 281-282, 283-284, and 6 hours in applied music, including 335-336. For emphasis upon theory, 12 hours selected in upper division theory courses, as advised, and 464 or 470. For emphasis upon music literature, 461, 462, 463, 464, 470, 483 or 484 and 481 or 485. All students tentatively planning to major in music should consult with the chairman of the music department immediately on entering the University of Hawaii.

PHILOSOPHY. 21 semester hours in addition to Phil 200, 201, and 210. Undergraduates planning work in Asian and Comparative Philosophy should take introductory courses in Indian, Buddhist and Chinese Philosophy.

PHYSICS. *Major requirement:* 32 semester hours including 170-171*, 272-273*, 274-275, 305, 310, 350, 430 or 450, 460, 480-481. These require the following in mathematics: 205-206, 231, 232, 402 or 403. Chemistry 113 through 116 or 117-118 are required.

POLITICAL SCIENCE. *Major requirement:* 27 semester hours. *Required courses:* 110 and 300-301. As part of his major, each student is required to complete introductory one-year sequences in three subfields, numbered 300 and above, including Political Science 300-301, Political Thought. The balance of the political science courses may be taken either within the same subfields or in others. "Topics" courses will be offered. As their contents will vary from year to year, they may be taken more than once for credit.

PSYCHOLOGY. *Major requirement:* 24 semester hours. *Required courses:* 100, 112, 113, and any two of the following three: 214, 215, and 216. The remaining courses must be selected from the 300-level or above.

RELIGION. *Major requirement:* 24 semester hours. *Required courses:* 200, 201, 482-483, 486.

RUSSIAN. *Major requirement:* 30 semester hours exclusive of 101-102, 201-202.

SOCIOLOGY. *Major requirement:* 24 semester hours. *Required courses:* 151 or 201, and one course from each of the following subdivisions: (1) 300-319 or 400-419; (2) 320-339 or 420-439; (3) 340-359 or 440-459; (4) 360-379 or 460-479; (5) 480-499.

SPANISH. *Major requirement:* 30 semester hours above the intermediate level. *Required courses:* 303-304, 330, 351-352, 430 or 441 or 444,

*May be replaced by Physics 160-161, by recommendation of instructor and with departmental approval, by those students who are transferring to a physics major program.

plus six units of literature. Majors must also pass the MLA Proficiency Tests for Teachers and Advanced Students (on Listening, Speaking, Reading and Writing). Portuguese 360 or 361 may be counted towards the major requirement.

SPEECH-COMMUNICATION. *Major requirement:* 30 semester hours. *Required courses:* 101, 202, 203, 304, 305, 406; additional requirements: Psychology 322, 430.

ZOOLOGY. *Major requirement:* 24 semester hours. *Required courses:* 490. As related courses, Biology 220; Biology 250 or Zoology 430; Chemistry 113–116 or 117–118, and 243–246; and Mathematics 134 are required. Credit toward the major will be granted for Biology 220, 250, Genetics 451–452, and courses in entomology. Students planning to continue their professional education beyond the B. A. degree should have, in addition, one year of physics and mathematics through calculus; additional training in botany is desired.

BACHELOR OF FINE ARTS DEGREE PROGRAMS

Basic and area requirements are those of the bachelor of arts degree programs except that a foreign language is not required.

Majors (B.F.A. Degree)

ART. This program is designed to provide basic preparation in Ceramics, Drawing, Painting, Printmaking, Sculpture, Textiles, Visual Design, and Weaving. Requirements include 63 credits in the field of Art of which 18 must be in Art History. All majors must take the 12 credit hours of introductory studio courses and Art 101 and are strongly advised to register for Art 101 and one of the introductory studio courses in their first semester.

ARCHITECTURE. The department of architecture offers a comprehensive undergraduate program leading to the pre-professional degree of B.F.A. in environmental design, providing a wide range of education which encompasses the disciplines of Architecture, Landscape Architecture, Planning and Urban Design. It serves the important function of preparation for professional study at the graduate level in these professions as well as an introduction to the liberal arts. Completion of 38 credits in the major including 271, 273, 274, 275, 276 are required for graduation.

BACHELOR OF MUSIC DEGREE PROGRAM

Basic Requirements

English 100; Speech-Communication 145; History 151–152, or 351–352 or 161–162; Mathematics 100 or Philosophy 210; for students concentrating in voice, French 101–102 and German 101–102.

Distributive Requirements

A. One course from the following:*

1. English 251-252, 253-254, 255-256; Drama 160.
2. Philosophy 100, 200; Religion 150, 151.

B. Three courses, including one from each group:

1. Psychology 100, 110, 214, or 322; Sociology 151, 201 or 324; Anthropology 150 or 200; Social Sciences 301-302.
2. Economics 120, 150 or 151; Political Science 110; Geography 102 or 151.

C. Three courses from the following:

Chemistry 113 and 115, 114 and 116; Geography 101; Geosciences 101, 102; Oceanography 201; Physics 100, 110-111, 160-161, 170, 272, 274. Botany 101; Genetics 451-452; Microbiology 351; Zoology 101. General Science 121-122; Biology 220.

Music Concentrations

COMPOSITION. Basic theory: 180, 181-182, 183-184, 281-282, 283-284; music history: 265-266; applied music: 5 credits in 135-136, 235-236, 335 and 2 credits in 431, in major performance field; secondary piano: 115-116, 215-216; music literature: 4 credits from 461, 462, 463, 464 or 469; advanced theory: 481-482, 483-484, 485-486; composition: 487-488, 489-490; conducting: 325-326; instrumental and vocal methods: 12 credits from 151-152, 153, 154, 155, 452, 458; ensembles and organizations: 7 credits from 401, 402, 404, 405, 409; music electives: 4 credits; free electives: 6 credits.

ORCHESTRAL INSTRUMENTS. Basic theory: 180, 181-182, 183-184, 281-282, 283-284; music history: 265-266; applied music: 8 credits in 135-136, 235-236 and 12 credits in 335-336, 435-436; secondary piano: 115-116, 215-216; music literature: 4 credits from 461, 462, 463, 464 or 469; advanced theory and composition: 481-482, 485-486, 487; conducting: 325-326; organizations: 8 credits in 405 and 409; ensembles: 6 credits in 401; music electives: 6 credits; free electives: 6 credits.

PIANO OR ORGAN. Basic theory: 180, 181-182, 281-282, 183-184, 283-284; music history: 265-266; applied music: 8 credits in 135-136, 235-236 and 12 credits in 335-336, 435-436; secondary performance: 2 credits from 131, 231, 123-124; music literature: 469, 4 credits in 420 (21), 4 credits from 461, 462, 463, 464; advanced theory: 481, 483-484, 485-486; piano methods: 358-359; conducting: 325; keyboard ensembles: 2 credits in 401 (21), one credit in 401 (22), and one credit in 401 (23); organizations

*This requirement is supplemented by Music 180 and 265-266 required in the music concentration.

and other ensembles: 6 credits from 401, 402, 404, 405, 409; music electives: 4 credits; free electives: 6 credits.

VOICE. Basic theory: 180, 181–182, 281–282, 183–184, 283–284; music history: 265–266; applied music: 8 credits in 135–136; 235–236, 6 credits in 335–336 and 8 credits in 435–436; secondary piano: 6 credits from 131 (21), 231 (21); music literature: 8 credits in 420 (11), 2 credits from 461, 462, 463, 464 or 469; advanced theory: 2 credits from 481, 483, 484, 485; organizations: 6 credits in 404, 8 credits in 402; music electives: 7 credits.

BACHELOR OF SCIENCE DEGREE PROGRAMS

Basic Requirements

English 100; Speech-Communication 145; History 151–152 or 351–352; Chemistry 114–116 or 117–118; Mathematics 205–206; Physics 170 through 273, or 160–161.

Distribution Requirements

- A. One course from each of the following groups:
 - 1. English 251, 252, 253, 254, or 255, 256; Drama 160.
 - 2. Philosophy 100, 200; Religion 150, 151.
 - 3. Art 101; Music 160, 170, 180.
- B. Three courses, including at least one from each of the following groups:
 - 1. Psychology 100, 110, 214, 320, 322; Sociology 151 or 201, 360; Anthropology 150, 200; Social Sciences 301, 302.
 - 2. Economics 120, 150, 151; Political Science 110; Geography 102, 151.

Majors (B.S. Degree)

BIOLOGY. *Major requirement:* 37 semester hours including Biol 220; Biol 250; Genetics 451 or Micro 475; Bot 470 or Zool 430 or Micro 480; Biochem 441–442 or Ag Biochem 402; Zool 631–632 or Math 201 or Math 231–2. Chemistry 243–246 and Physics 160–1 or Physics 170–275 and Math 205–206 are also required. Additional advanced courses may be selected from biochemistry, botany, genetics, microbiology or zoology. Appropriate additional advanced courses in chemistry, physics or mathematics are recommended. An intermediate year of German, French, Russian or Japanese is also required. Students tentatively planning to major in Biology should consult with the curriculum director, immediately on entering the University of Hawaii.

CHEMISTRY. *Major requirement:* 37 semester hours, in addition to 114–116 or 117–118; including 133–134, 243–245, 244–246, 333, 351, 352, 353 422, 444 and a minimum of 6 semester hours from the following: 493–494,

399, 445, 424, 621, 631, 641, 642, 651, 652, 655 and Biochemistry 601–602.

As related courses German 212 or Russian 208, Math 231 and Physics 170–171, 272–273 are required.

Recommended electives are Math 232, 311, 402, 431, 432, Physics 274.

GEOSCIENCES. A student must concentrate in one of the following fields: general, geochemistry, geology, geophysics, hydrology, meteorology, or oceanography. The field of concentration should be stipulated at the beginning of the third year and a suitable program of courses selected with department approval.

Major requirement: 38 semester hours, including 101–102 or the equivalent, from among appropriate offerings in geosciences, chemistry, civil engineering, geography, mathematics, oceanography, physics, and soil science. As related courses, Physics 170–171 and 272–275 are required.

PHYSICS. *Major requirement:* 35 semester hours, including 170–171*, 272–273*, 274–275, 305, 310–311, 350, 430 or 450, 460, 480–481. These require the following in mathematics: 205–206, 231, 232, 402 or 403. An intermediate year of one, or an introductory year of two of the following languages are required: French, German, Russian.

Recommended First Year Program For All B.S. Candidates

For entering students who have had high school courses in mathematics through pre-calculus, the following first year course schedule is recommended:

FIRST SEMESTER		SECOND SEMESTER	
	UNITS		UNITS
English 100 (or option)	3	English 100 (or option)	3
Mathematics 205	4	Mathematics 206	4
Chemistry 117–118	5	Physics 170–171	5
Speech 145 (or option)	3	Option (or Speech 145)	3

If the student does not have a high school course equivalent to Math 134 (pre-calculus), he may take this course at the University during a prior summer session. Otherwise Math 134 must be taken in an alternative first year schedule. He should obtain the recommendations for such a program from the appropriate departmental adviser before registering.

PREPROFESSIONAL PROGRAMS

By careful planning, students in the College can prepare themselves adequately for admission to professional and graduate schools. This is especially true in view of the increasing emphasis placed upon a liberal arts background by most of the professions.

*May be replaced by Physics 160–161, by recommendation of instructor and with departmental approval, by those students who are transferring to a physics major program.

In planning a program, the recommendations of the appropriate national professional organizations should be followed. In addition, when the student has selected the professional school he desires to enter, he should elect courses to fulfill the specific requirements of that school.

The College maintains a Pre-Medical Sciences Committee prepared to give specific aid to students preparing for schools of dentistry, medicine, veterinary medicine, pharmacy, or public health.

Information regarding the scholastic requirements of the other professions, such as law, is available at the office of the dean of student services of the College and at the Counseling and Testing Center.

Premedical Curriculum

The following is based upon the general admission requirements of medical schools. The majority of schools, however, require the entering students to have a bachelor's degree, as well.

Biology: Biology 220 and 250 (general), 320 (vertebrate), and 420 (embryology).

Chemistry: Chemistry 114–116 or 117–118 (general), 243, 245, 244, and 246 (organic), 133 and 134 (quantitative).

Physics: Physics 160 and 161 (general).

Mathematics: Mathematics 205 and 206 (calculus).

Desirable electives: Physical chemistry, statistics and genetics.

It is recommended that premedical students obtain the book entitled *Admission Requirements of American Medical Colleges* (\$4.00; address: AAMC, Dept. 3B, 2530 Ridge Ave., Evanston, Illinois 60201) for detailed information on individual medical schools and their admission policies.

Requirements of dental schools are similar to those of medical schools, with the exception that more do not require a bachelor's degree. For details see *Admissions Requirements of American Dental Schools* (\$2.00; address: AADS, 211 East Chicago Avenue, Chicago, Illinois 60611).

Schools of pharmacy usually require for admission one year of college study. This must include courses in English, chemistry, zoology, botany, trigonometry, and algebra.

Catalogs of individual schools of medicine, dentistry, veterinary medicine, and pharmacy with more specific admission requirements and information may be found in Sinclair Library. Interviews with the premedical adviser throughout the program are recommended.

NON-MAJOR PROGRAM

A non-major program, in which the student designs a related constellation of courses in consultation with a faculty adviser, is offered by the College of Arts and Sciences. Please see page 60 for further details.

ARTS AND SCIENCES COURSES

See pp. 4-5 for a discussion of course descriptions.

Aerospace Studies (AS)

Professor HARTEL; Assistant Professors VEYLUPEK, KOZUMA;
Instructors BELANGIA, KIVETT

Leadership Laboratory required 1 hour per week for each course listed.

- 100 Field Training Unit, Summer, Two-Year Program (2) I** **Staff**
Intensive 6-week military training course at an Air Force base. Includes classroom work covering material presented in basic Aerospace Studies courses.
- 230 Field Training Unit, Summer, Four-Year Program (2) I** **Staff**
Intensive 4-week course at an Air Force base. Applications of academic work. Air operations problems; military aircraft and equipment. Physical training. Pre: 301 or 302.
- 301, 302 Third-Year Aerospace Studies (3, 3) I, II** **Kozuma**
Survey course about development of U.S. airpower and its concepts, doctrine, employment; and about astronautics and space operations and future development of aerospace power.
- 451, 452 Fourth-Year Aerospace Studies (3, 3) I, II** **Hartel, Veylupek**
Study of professionalism, leadership, management. Includes leadership theory, functions and practices as they apply to Air Force.

American Studies (AmSt)

Professors BROWN, DENNEY, HSU (visiting), LUTZKY, MATSON; Associate Professors GURIAN, MCCUTCHEON; Assistant Professor NEIL; Acting Assistant Professors BESSELINK, PHILIPSE; Instructors FERDON, KINGHORN

- 201-202 Introduction to American Civilization (3-3) Yr.** **Neil**
The central concerns of contemporary American life and thought studied in the light of multidisciplinary perspectives.
- 231-232 The Hero in the Western World (3-3) Yr.** **Gurian**
Study of how religious, mythic and historical hero-types have embodied humanistic values in Western societies. (cross-listed as IS 231-232)
- 301-302 Man in Society (3-3) Yr.** **Matson**
Some basic problems and processes of contemporary society, jointly examined by several social sciences. Pre: sophomore standing or consent of instructor. (cross-listed as Soc 301-302)
- 370 Music in Modern America (3) I, II** **Lutzky, Trimillos**
Varieties of music, including jazz and popular forms, in contemporary American life, with relevant antecedents. (cross-listed as Music 370)
- 397 Social Thought in East and West (3) II** **Denney, Ferdon**
Some basic problems and processes of human society, examined through a comparison of East and West.
- 475 American Taste (3)** **Neil**
Study of popular attitudes towards the arts, travel, fashions, craft and industrial productions, and recreation. Past will be used to explain present.

- 485-486 Contemporary American Civilization (3-3) Yr.** **Gurian**
1st sem: Development of modern dissent and its uses in American religious, political, social movements. *2nd sem:* Race in contemporary America: traditions, attitudes, issue and programs concerning the Negro, the Amerind, and the white.
- 490 Special Topics (3) I, II** **Hsu**
 Problems of contemporary relevance presented by visiting faculty. *1st sem:* Americans and Chinese: a comparative cultural study. *2nd Sem:* Americans, Japanese and Indians: a comparative cultural study.
- 495 Black Americans and American National Character (3) I, II**
 Examination of the nature of American national character and of the role Black Americans have played in the making of that character. Pre: U.S. history and a survey course in either sociology or anthropology.
- 615 Leaders and Movements in American Thought (3) I, II** **Brown, Neil**
 Examination in depth of two or three significant personalities in American history and literature and the movements which originated from their ideas. Different personalities considered each semester. May be repeated for credit.
- 631 The Mass Media in American Society (3) I** **Matson**
 Examination of the relationship between mass communication media and patterns of culture, society and politics in America.
- 635 Perspectives in Comparative Literature (3) II** **Denney**
 To explore, in Asian and Western literary works, literary questions that are cross-cultural and comparative.
- 641 Asian Influences in American Civilization (3) I, II** **McCutcheon**
 To examine the influence of Asia in American history, literature, politics, thought, architecture, and fine arts.
- 650 American Civilization and the Overseas American (3) II** **Brown**
 Examination of American civilization with special reference to those issues, principles, and problems most significant to Americans preparing for work and study in other areas of the world.
- 665 Seminar: Presidential Leadership & American Civilization (3) I, II** **Brown**
 Interdisciplinary studies of the impact of various presidencies on social, political, economic, and cultural life of U.S. and the response of presidents to popular currents of thought. Different presidents examined each semester. May be repeated for credit.
- 670 Seminar: Sociability in the United States (3) II** **Denney**
 Applications of concepts, definitions, classifications, and discriminations developed in the social sciences to materials dealing with institutions of sociability and hospitality in U.S.
- 685-686 Seminar: Nature of American Society (3-3) Yr.** **Besselink**
 Examination and interpretation of American people and society for foreign students. Pre: consent of instructor.
- 690 Introduction to Contemporary America (3) I, II** **Lutzky**
 Survey of people, society, arts and sciences, business and government for students preparing to teach English as a second language. Pre: consent of instructor.
- 695 Image of Man in Contemporary Social Sciences (3) II** **Matson**
 Examination of American social science theory and research in terms of humanistic goals and commitments. Critical analyses of competing paradigms and basic assumptions regarding human nature and conflict.
- 701 Methods in American Studies (3) I** **Philipose**
 Consideration of alternative conceptual frameworks, with corresponding research methods, appropriate to American Studies.
- 702 Proseminar (3) II**
 Discussion of standard works in the field. Pre: consent of instructor.

711 Pro-Seminar in American Representative Institutions (3) I

An examination of the American experiment with representative institutions, public and private. Pre: consent of instructor.

712 Pro-Seminar in American Beliefs (3) II

Intensive readings in the beliefs of Americans as expressed in character and culture studies. Pre: consent of instructor.

750 Seminar in the Interaction of Asia and America (3) II

Lutzky

Effect of inter-cultural exchange of ideas, values, and techniques between peoples of Asia and U.S. Pre: consent of instructor.

799 Directed Research (arr.) I, II

Pre: graduate standing; consent of instructor.

800 Thesis Research

Staff

Anthropology (Anth)

Professors BATESON, LEBRA, LUOMALA, MARETZKI, OLIVER, SOLHEIM; Associate Professors BOGGS, DEWEY (on leave 1969/70), GREEN, MAHONEY, PEARSON; Assistant Professors EYDE, GRIFFIN, LESSIN, LEWIS, PIETRUSEWSKY, QUINN

150 Introduction to Anthropology (3) I, II

Human evolution; prehistoric development of culture; recent and contemporary man, common features and principal variations in cultural behavior.

200 Cultural Anthropology (3) I, II

Nature of culture; basic concepts for analyzing cultural behavior; patterning, integration, and dynamics of culture; culture and the individual.

210 Archeology (3) I, II

Introduction to prehistoric archeology; methods and techniques of excavation and laboratory analysis; brief survey of man's cultural growth in prehistoric times. Pre: 150 or 200 or written consent of instructor.

215 Physical Anthropology (3) I

Introduction to physical anthropology. Survey of primatology. Changes in the bone structure of man from prehistoric periods to the present. Survey of the fossil evidence for human evolution. Human growth and constitution.

220 Ethnography (3) I, II

Comparative study of selected folk, peasant, urban societies of the world. Pre: 150 or 200 or written consent of instructor.

230 Social Anthropology (3) I, II

Systematic study of human social institutions; general principles of social interaction formulated from ethnographic data. Pre: 150 or 200 or written consent of instructor.

250 Oceania (3) I

Introduction to native cultures of Polynesia, Micronesia, Melanesia, Australia. Pre: 150 or 200 or written consent of instructor.

310 Human Evolution (3) II

Human genetics, principles of evolution related to evidence from prehistoric man. Variations in contemporary human populations. Pre: 215 or written consent of instructor.

399 Directed Reading or Research (arr.) I, II

Limited to majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in anthropology.

ANTHROPOLOGY

All courses in the 400 series may be taken for graduate credit.

400 Anthropological Statistics (3) II

Introduction to statistical methods and their use in analysis of anthropological data. Pre: 200 or written consent of instructor.

410 Foundations of Anthropological Method (3) I

Empirical and logical bases of the social sciences applicable in anthropological inquiry. Pre: 200 or written consent of instructor.

420-421 Archeological Techniques (3-3) I, II

Archeological survey and excavation; week-end field trips, mapping, photography, recording. Laboratory analysis and evaluation of field data; preservation and restoration of artifacts. Preparation of materials for publication. Pre: 210 or equivalent and course in statistics, or written consent of instructor.

440 Regional Cultures of Asia (3) I, II

Historical problems and regional developments in ecology, social structure, world view, and other aspects of selected indigenous cultures. Selected cultures to be covered in a region will be named in the semester course schedule. (1) Continental East Asia, (2) Continental Southeast Asia, (3) Insular Southeast Asia, (4) South Asia. Pre: 200, or written consent of instructor. May be repeated.

450 Regional Cultures of Oceania (3) I, II

Historical problems and regional developments in ecology, social structure, world view, and other aspects of indigenous cultures. (1) Hawaii, (2) Micronesia, (3) Polynesia, (4) Melanesia. Pre: 250, or written consent of instructor.

460 Regional Archeology (3) I, II

Regional surveys of prehistoric cultures, based on archeological research. (1) Asia and Pacific, (2) Europe, Africa, and Near East, (3) North and South America. Pre: 210, or written consent of instructor. May be repeated.

470 Arts in Cultural Perspective: Folklore (3) I

Art as aspect of culture; technique, form, style, and meaning, viewed cross-culturally. Complements Music 471 and Art 472 in which credit towards major will be granted. Pre: 150 or 200 or written consent of instructor.

475 Comparative Religion (3) II

Origins and development of magic and religion, primarily among tribal and folk societies. Ritual and symbolism as aids to social and cultural integration. Pre: 150 or 200, or written consent of instructor.

480 Anthropological Applications (3) I, II

Anthropological theory, method, data applied to problems in specialized fields. Oriented to needs of students in professional fields who lack anthropological background. (1) Development, (2) health, (3) education (same as Ed EF 480).

491 Senior Honors Seminar I (3) I

Integration of concepts, approaches to knowledge, historical development of theory, major findings in physical anthropology and prehistory. Open to anthropology majors with 3.0 GPR and above. Pre: consent of coordinator of undergraduate honors studies and instructor.

492 Senior Honors Seminar II (3) II

Integration of concepts, approaches to knowledge, historical development of theory, major findings in cultural anthropology and linguistics. In linguistics, emphasis on such topics as language and culture, and significance of linguistic theory and methodology for research in anthropology. Open to anthropology majors in honors program and other qualified honors students. Pre: consent of coordinator of undergraduate honors studies and instructor.

650 Proseminar: General Anthropology (3) I

Major issues and problems in principal fields of anthropology: biological anthropology. Pre: classified graduate standing in anthropology, or written consent of instructor for other classified graduate students.

651 Proseminar: General Anthropology (3) II

Major issues and problems in principal fields of anthropology: archeology. Pre: classified graduate standing in anthropology, or written consent of instructor for other classified graduate students.

652 Proseminar: General Anthropology (3) I

Major issues and problems in principal fields of anthropology: social anthropology. Pre: classified graduate standing in anthropology, or written consent of instructor for other classified graduate students.

653 Proseminar: General Anthropology (3) II

Major issues and problems in principal fields of anthropology: psychological anthropology. Pre: classified graduate standing in anthropology, or written consent of instructor for other classified graduate students.

660 Social Organization (3) I

Analytical study of organized group activity in societies of varied complexity. Theories of kinship and social structure. Pre: classified graduate standing and 6 credits of social/cultural anthropology, or written consent of instructor.

665 Psychological Anthropology (3) II

Study of personality in relation to sociocultural systems. Theories and techniques for analysis. Pre: classified graduate standing and 6 credits of social/cultural anthropology, or written consent of instructor.

670 Archeology (3) I

Intensive review of origin and development of cultures in Old and New Worlds as revealed by archeology. Pre: 650 or equivalent, or written consent of instructor.

690 Ecological Anthropology (3) II

Study of relationship of man with his natural environment, particularly emphasizing role of culture as dynamic component in ecological systems. Patterns of production, exchange, property, consumption. Pre: classified graduate standing and 6 credits of social/cultural anthropology, or written consent of instructor.

699 Directed Reading or Research (arr.) I, II

Pre: classified graduate standing, or written consent of instructor.

700 History of Anthropology (3) I

Historical development of anthropology, emphasizing unity of diverse fields which constitute study of man. Pre: classified graduate standing and 6 credits of social/cultural anthropology, or written consent of instructor.

710 Anthropological Techniques (3) II

Theory construction and research design; collection of data (objective, subjective, projective techniques); processing and evaluation of data. Pre: 410, 650-651 or equivalent, and a course in statistics.

750 Research Seminar (3) I, II

Reporting and discussion of selected problems in current research. (1) Archeology, (2) linguistics, (3) ethnography, (4) social anthropology, (5) applied anthropology, (6) psychological anthropology, (7) biological anthropology. Pre: classified graduate standing and written consent of instructor. May be repeated.

800 Thesis Research (arr.) I, II

Architecture (Arch)

Professors ETHERINGTON, TERAZAKI; Assistant Professors BURGESS, MAHONEY; Instructors GAY, WATSON

Completion of all university and college of arts and sciences core and area requirements including SS 131 or Art 101, SS 132, Social Sciences 301-302 are prerequisites to all courses numbered 200 and above. In addition, Phys 160 and Math 205 are required of all architecture majors. Exceptions are courses in the ecology stream 271, 272, 471, 472.

Completion of 271, 273, 274, 275, 276 are the prerequisites, except as noted, to all architecture courses numbered 300 and above.

The department may retain any student work for departmental use.

GENERAL COURSES

- 271 World of Environmental Design (3) I** Yanoviak
World-wide survey of man's attitude to the provision of shelter and the environmental setting of his life from prehistoric times to the present day.
- 272 World of Environmental Design (3) II** Yanoviak
Continuation of 271. Pre: 271.
- 273 Design Processes (3) I, II (2L, 1 Lb)** Gay, Mahoney
Introduction to analytic and synthetic techniques in environmental design including use of the computer.
- 274 Communication and Presentation (3) I, II (2L, 1 Lb)** Morrison
Basic graphic and written techniques for environmental design communication. Projection and perspective drawing, models, reports and photography.
- 275 Introductory Seminar (2) I, II** Etherington
Study of the Professions contributing to the field of environmental design.
- 276 Introductory workshop (3) I, II** Watson
Planned sequence of problems applying the principles of analytic and synthetic design processes and development of communication and presentation techniques. Pre: previous or concurrent registration in 271, 273 and 274.
- 374 Computer Graphics (3) I, II (2L, 1Lb)** Gay
Applications and research related to architecture, visual design and planning. Description and generation of visual form.
- 394-395 Senior Honors Thesis (3-3) Yr.**
Preparation of architectural design under individual faculty supervision. Required for graduation with honors. Pre: consent of instructor.
- 399 Directed Work (arr.) I, II**
Pre: consent of instructor.
- 400 Special Projects in Architecture (arr.)**
Intensive and specialized work at an advanced level in fields of special interest of visiting staff. See announcement for current offering. May be repeated. Pre: advanced standing and consent of chairman.
- 470 Environmental Studies Seminar (2) (arr.)** Katz
Exploration of interdisciplinary questions in environmental studies. May be repeated. Pre: advanced standing and consent of chairman.
- 471 Field Studies (arr.)** Etherington
Study tours to various countries to examine historical and contemporary art and architecture with lectures at various sites. May be repeated. Pre: consent of instructor. (cross-listed with Art 471)
- 472 Japanese Architecture and Landscaping (3) II**
Review of Japanese architecture and landscaping from historical to present times including shrines, temples, gardens and domestic architecture with a study of the people, their motives and philosophies as they affect architecture. Pre: consent of instructor. (offered 1970)

- 616 Professional Practice (3) I** **Haines**
 Ethical and economic problems of professional practice. Pre: consent of instructor.
- 699 Directed Work (arr.) I, II**
 Pre: consent of instructor and chairman.

ARCHITECTURE

- 331 Architecture "A" (3) I, II (2L, 1Lb)** **Burgess**
 Study of principles of architecture in terms of social needs, physical planning and design. Theories and methods are explored.
- 332 Architecture "B" (3) I, II (2L, 1Lb)** **Watson**
 Development of principles studied in "A" to include analysis of significant examples of urban, single and multi-building types.
- 333 Architecture "C" (3) I, II (2L, 1Lb)** **Gay**
 Identification of goals, needs, and activities in design, strategies and procedures.
- 431 Architecture "D" (4) I**
 Advanced studio problems involving site planning design of buildings or groups of buildings. Pre: consent of chairman.
- 432 Architecture "E" (4) II**
 Advanced studio problems involving integration of mechanical, structural, and component systems, building codes, climatic environmental conditions in buildings. Pre: 431.
- 438 Architecture "F" (5) I**
 Advanced individual studio problems with reference to the methodology of planning, design, and morphology. Pre: 432.
- 439 Architecture "G" (5) II**
 Continuation of Arch 438. Pre: 438.

ARCHITECTURAL ENGINEERING

Structural Systems

- 301 Architectural Structures "A" (3) I, II** **Powell**
 Structure in architecture. Introduction to strength of materials and basic mechanics. Pre: Math 205. (cross-listed with CE 301)
- 302 Architectural Structures "B" (3) I, II** **Powell**
 Mechanics and strength of materials, design of simple beams, columns and trusses in various materials. Pre: 301. (cross-listed with CE 302)
- 303 Architectural Structures "C" (3) I** **Terazaki**
 Application of structural systems in architecture. Introduction to statically indeterminate systems. Continuous beams, concrete slabs. Design of steel and reinforced concrete buildings. Pre: 302. (cross-listed with CE 303)
- 401 Architectural Structures "D" (4) I** **Terazaki**
 Layout and integration of structural systems in architectural design. Continuous frames. Design of building structures to ACI and AISI standards. Introduction of advanced structural systems as applied to contemporary architecture. Pre: 303.
- 402 Architectural Structures "E" (4) II** **Terazaki**
 Analysis of statically indeterminate structures. Design of advanced structural systems. Ultimate strength and plastic design. Advanced structural analysis including introduction to computer applications. Pre: 401.
- 601 Architectural Kinetics (4) II** **Terazaki**
 Architectural and structural synthesis with systematic evaluations. Modular coordination and standardization. Survey of prefabrication methods and industrialization in various countries. Space structures. Pre: 402.

ARCHITECTURE

Building Technology

- 311 **Building Technology "A" (3) I (2L, 1Lb)** **Rummel**
Properties of building materials, surveying, review of component systems.
- 312 **Building Technology "B" (3) II (2L, 1Lb)** **Rummel**
Principles of working drawings and specifications, and their application to the building industry. Pre: 311.
- 411 **Building Technology "C" (3) I (2L, 1Lb)** **Rummel**
Evaluation of building materials, performance standards and cost control. Pre: 312.
- 412 **Building Technology "D" (3) II (2L, 1Lb)** **Rummel**
Construction systems and techniques. Pre: 411.

Environmental Systems

- 321 **Architectural Climatology (3) I, II (2L, 1Lb)** **Mahoney**
How climate affects the design of buildings, with emphasis on tropical climates. Climate and comfort analysis, solar control, thermal control, design for air movement and ventilation. Thermal planning, design of external openings, design of solid elements. Evaluation of an existing building.
- 322 **Mechanical and Electrical Equipment (3) I, II (2L, 1Lb)** **Kohlas, McMahon**
Mechanical and electrical system and equipment. Water supply and plumbing systems. Fire protection. Principles of heating and air conditioning. Layout and sizing of systems. Electrical installation, wiring design. Elevators and escalators. Functional total design in relation to architectural design, structure and construction. Pre: Phys 160.
- 421 **Environmental Control (3) I (2L, 1Lb)** **Terazaki**
Components of environmental control design. Physiological responses to thermal, luminous and aural environments. Comfort zone conditions including tropical conditions. Applied psychrometrics. Temperature and humidity regulating devices. Illumination. Architectural acoustics. Integration of building sciences to architectural design, structure and construction. Pre: 322.
- 621 **Seminar on Tropical Architecture (2) II** **Mahoney**
Problems, philosophies and systems of tropical architecture from various areas of tropics and sub-tropics. Pre: consent of instructor.

LANDSCAPE ARCHITECTURE

- 351 **Elements of Landscape Architecture (3) II** **Austin, Moore**
Survey of the principles and theories of landscape architecture.

PLANNING AND URBAN DESIGN

- 341 **Elements of Urban Design (3) II (2L, 1Lb)** **Grant**
Contemporary problems and solutions in urban studies and the interaction between physical form and social, economic, political and technological needs of society.
- 640 **Architecture and Planning in Tropical Areas (4) I** **Mahoney**
Socio-economic and political factors in physical development, formulation and execution of building programs. Programming as applied to housing and educational facilities. Pre: consent of instructor.

Art (Art)

Professors ANDERSON, COX, HORAN, KINGREY, NEOGY, NORRIS, ROBINSON, TURNBULL;
Associate Professors KIMURA, LENOX, McVAY, STASACK; Assistant Professors BUSHNELL,
GILL, HAVAAS, PREBLE, SATO, WISNOSKY; Instructors DAVIDSON, GILBERT, KATZ, SCOTT
Professor ECKE

The history of art as well as the studio programs are concerned with the creative, the experiential and the developmental aspects of art.

Except as noted, completion of introductory studio courses Art 113, 114, 115, 116 and Art 101 or IS 131 is the prerequisite to all studio courses numbered 200 and above. Art 101 is the prerequisite to all art history courses but other appropriate preparation may be substituted with the consent of the instructor.

The department may retain any student work for departmental use.

- 101 Introduction to the Visual Arts (3) I, II** **Preble**
Nature of visual art and its expressions in various forms. Lectures, demonstrations.
- 105 Elementary Studio—Ceramics (3) I, II** **Staff**
Studio experience mainly for non-majors. Lectures and projects. Credit cannot count towards major requirements in Art.
- 106 Elementary Studio—Sculpture (3) I, II** **Staff**
Studio experience mainly for non-majors. Lectures and projects. Credit cannot count towards major requirements in Art.
- 107 Elementary Studio—Photography (3) I, II** **Staff**
Studio experience mainly for non-majors. Lectures and projects. Credit cannot count towards major requirements in Art.
- 108 Elementary Studio—Drawing and Painting (3) I, II**
Studio experience mainly for non-majors. Lectures and projects. Credit cannot count toward major requirements in Art.
- 113 Introductory Studio "A" (3) I, II** **Staff**
Emphasis on perception: visual responses to nature; materials, techniques, modes of representation. Problems in two and three dimensions involving photography, drawing, painting, sculpture and construction. Pre: 101 or IS 131 (may be taken concurrently). Offered only as pass-fail.
- 114 Introductory Studio "B" (3) I, II** **Staff**
Emphasis on light: environmental; general intensity; value range; sources; chiaroscuro; pattern; principles of color. Problems in two and three dimensions involving drawing, painting, sculpture, design. Pre: 101 or IS 131 (may be taken concurrently). Offered only as pass-fail.
- 115 Introductory Studio "C" (3) I, II** **Staff**
Emphasis on space: environmental; actual and illusionary; changing spatial systems and space modifiers. Problems in two and three dimensions involving drawing, painting, sculpture, design. Pre: 101 or IS 131 (may be taken concurrently). Offered only as pass-fail.
- 116 Introductory Studio "D" (3) I, II** **Staff**
Emphasis on time, motion, systems: visual kinetics sequence, rhythm, order and systems. Problems in two and three dimensions involving drawing, painting, sculpture, design. Pre: 101 or IS 131 (may be taken concurrently). Offered only as pass-fail.
- 131 Man and the Arts**
Same as IS 131; see "Interdisciplinary Studies."
- 132 Man and His City**
Same as IS 133; see "Interdisciplinary Studies."
- 394-395 Senior Honors Theses (3-3) Yr.** **Staff**
Projects under individual faculty supervision. Required for graduation with honors. Pre: junior standing.
- 399 Directed Work (arr.) I, II**
Pre: consent of instructor and chairman.

ART

- 699 **Directed Work (arr.) I, II**
Pre: consent of instructor and chairman.
- 800 **Thesis Research (arr.) I, II**

ART HISTORY (Art)

- 270 **Aspects of European and American Art (3), I, II** **Scott**
Major developments in arts of Europe and America.
- 280 **Aspects of Asian Art (3) I, II** **Staff**
Major developments in arts of Asia.
- 370 **Ancient Art (3) I** **Scott**
Arts of Mediterranean Basin from pre-historic times to Christian era. Pre: 270
- 371 **Medieval Art (3) II** **Scott**
Arts of Europe from early Christian era to Renaissance. Pre: 270.
- 376 **Modern Art (3) II** **Scott**
Sculpture and painting of Europe and America in 19th and 20th centuries. Pre: 270.
- 384 **Art of Japan and Korea (3) I**
Major developments in arts of Japan and Korea. Pre: 280.
- 385 **Art of China (3) I** **Ecke**
Major developments in arts of China. Pre: 280.
- 391 **Art of South Asia (3) I** **Neogy**
Major developments in arts of South Asia, West Asian context and growth of South-east Asian art. Pre: 280.
- 470 **Renaissance Through Rococo (3) I** **Scott**
Arts of Europe during Renaissance, Mannerist, Baroque and Rococo periods. Pre: 270.
- 471 **Art and Architectural Field Studies (arr.)** **Etherington**
Study tours to various countries to examine historical and contemporary art and architecture with lectures at various sites. Pre: consent of instructor. May be repeated.
- 472 **Primitive Art (3) I** **Gill**
Survey of styles and esthetic characteristics of arts of pre-literate cultures.
- 475 **Arts of the Pacific (3) II** **Cox**
Stylistic and esthetic characteristics of indigenous arts of Oceania, including Australia, Indonesia, Micronesia, Melanesia, Polynesia.
- 483 **Modern Art of Japan (3) II**
Arts of Edo Period, woodblock prints, folk arts, Nationalist revival and modern movement of 19th and 20th centuries. Pre: 280.
- 485 **Applied Arts of China (3) II**
Architecture, furniture, landscaping, ceramics, metal work, lacquer, textiles. Pre: 280.
- 491 **Art of Islam (3) II** **Neogy**
Major developments in arts and architecture of Islam. Pre: 280.
- 495 **Art of Southeast Asia (3) I** **Gill**
Examination of the sculpture, painting, and architecture of the metropolitan civilizations of Vietnam, Cambodia, Laos, Burma, Thailand, Malaysia, and Indonesia. Pre: 280.
- 675 **Arts of Hawaii (3) I** **Cox**
Stylistic and aesthetic characteristics of the arts of ancient Hawaii, their relationship to the arts of Polynesia. Pre: consent of chairman and instructor.
- 676 **Arts of Indonesia and Melanesia (3) II** **Gill**
Stylistic and esthetic characteristics of arts of southwest Pacific cultures. Pre: consent of chairman and instructor.
- 680 **Early Chinese Painting (3) I** **Ecke**
From earliest times through Sung dynasty. Pre: consent of chairman and instructor.

- 686 Later Chinese Painting (3) II** **Ecke**
From end of Sung dynasty to present. Pre: consent of chairman and instructor.
- 691 Art of Central Asia (3) I** **Neogy**
Hellenistic and Roman influences in south and central Asia. Origins of Buddha image. Pre: consent of chairman and instructor.
- 780 Early Arts of Japan (3) I**
From pre-historic times to preponderance of Buddhist imagery. Pre: consent of chairman and instructor.
- 781 Later Arts of Japan (3) II**
Rise of Yamato School. Influences of Zen and tea taste. Pre: consent of chairman and instructor.
- 791 Buddhist and Hindu Art (3) II** **Neogy**
Development of Buddhist and Hindu art in South and Southeast Asia. Pre: consent of chairman and instructor.

CERAMICS (Art)

- 243 Ceramics A (3) I, II** **Staff**
Introduction to ceramic forms using hand building and wheel throwing techniques. Introduction to glazing techniques and surface treatment. Seminars.
- 244 Ceramics B (3) I, II** **Staff**
Intermediate wheel throwing and hand building. Operation and care of kilns. Seminars. Pre: 243.
- 341 Advanced Ceramics (3) I, II** **Staff**
Wheel throwing or hand building. Individual development. Seminars. Pre: 244. May be repeated.
- 342 Glaze Calculations (3) I, II** **Staff**
Molecular formulae of glazes; temperature effects. Analysis of quality of glazes clay bodies. Seminars. Pre: 244. May be repeated.
- 646 Ceramics (3) I** **Staff**
Individual problems in advanced ceramics using hand building techniques. Seminars. Pre: consent of chairman and instructor. May be repeated.
- 647 Ceramics (arr.) II** **Staff**
Individual problems in advanced ceramics using potter's wheel. Seminars. Pre: consent of chairman and instructor. May be repeated.
- 648 Ceramic Glazes and Clay Bodies (3) I** **Staff**
Individual problems in glazes and firing techniques. Seminars. Pre: consent of chairman. May be repeated.
- 649 Ceramics (3) II** **Staff**
Individual problems in clay bodies and firing techniques. Seminars. Pre: consent of chairman and instructor. May be repeated.

DRAWING (Art)

- 213 Figure Drawing (3) I, II** **Bushnell, Kimura**
Intensive drawing from human figure. May be repeated.
- 214 Anatomy for Artists (3) II** **Staff**
Introduction to anatomy and articulation.
- 313 Advanced Drawing Studio (3) I, II** **Staff**
Creative projects in drawing, graphic techniques. Models provided. Pre: 213 and 214. May be repeated.

ART

GLASS BLOWING (Art)

- 401 Glass Blowing (3) I** **Horan**
Forming of glass while in a molten condition using off hand blowing and tooling techniques. Decorative techniques as applied both to the hot workable glass as well as the cooled annealed glass. Pre: 341 or 353 or consent of instructor.
- 402 Glass Blowing (3) II** **Horan**
Continuation of 401. The designing, construction and using of molds to blow glass in, for utilitarian and sculptural objects. Construction of glass furnaces and lehrs.

PAINTING (Art)

- 220 Materials and Techniques (3) I** **Gilbert**
Painting studio with emphasis on materials and techniques.
- 223 Painting "A" (3) I, II** **Staff**
Painting from studio and outdoor subject matter. Elements of pictorial style.
- 224 Painting "B" (3) I, II** **Staff**
Painting from identifiable sources; emphasis on expression and structure. Oil and related media. Pre: 223.
- 225 Painting "C" (3) II** **Staff**
Emphasis on water-soluble media, including contemporary developments. Pre: 220.
- 323 Advanced Painting (3) I, II** **Norris**
Development of independent expression with considerable freedom of choice. Seminars. Pre: 224 or 225. May be repeated.
- 624 Painting (3) I, II** **Norris**
Individual problems in advanced painting. Seminars. Pre: consent of chairman and instructor. May be repeated.

PHOTOGRAPHY (Art)

- 207 Photography A (3) I, II** **Salmo**
Camera as tool of expression and photography as basic art form. Student required to have own camera.
- 208 Photography B (3) I, II** **Salmo**
Development of form in photography. Pre 207.
- 209 Basic Cinematography (3) II** **Staff**
Introduction to 8 and 16 mm film production. Pre: basic still-photography experience. Students supply their own cameras.
- 407 Advanced Photography (3) I, II** **Salmo**
Individual problems in advanced photography. Seminars. Pre: 208. May be repeated.

PRINTMAKING (Art)

- 217 Printmaking (3) I, II** **Staff**
Technical controls; development of concepts appropriate to printmaking. May be repeated.
- 317 Advanced Printmaking (3-3) I, II** **Staff**
Independent projects; advanced studio practice. Seminars. Pre: two semesters of 217. May be repeated.
- 617 Printmaking (3-3) I, II** **Staff**
Individual problems in intaglio, relief and planographic processes. Seminars. Pre: consent of chairman and instructor. May be repeated.

SCULPTURE (Art)

- 253 Sculpture (3) I, II** **Staff**
Study of form and structure, using variety of materials and techniques. Seminars.

- 254 Intermediate Sculpture A (3) I, II** **Staff**
Developing concepts of form and form relationships using a variety of materials with an emphasis on carving and casting. Seminars. Pre: 253.
- 255 Intermediate Sculpture B (3) I, II** **Staff**
Developing concepts of form and form relationships using a variety of materials with an emphasis on the additive process. Seminars. Pre: 253.
- 353 Advanced Sculpture (3) I, II** **Staff**
Individual projects stressing experimentation and subjective approach to form. Seminars. Pre: 254, 255. May be repeated.
- 653 Graduate Sculpture (arr.) I, II**
Pre: consent of chairman and instructor.

TEXTILE DESIGN (Art)

- 230 Textile Design (3) I, II** **Havaas**
Design problems for production of printed fabric utilizing silk screen techniques. Seminars.
- 330 Advanced Textile Design (3) I, II** **Havaas**
Design and execution of printed fabric, utilizing photographic processes and combined techniques of silkscreen printing. Seminars. Pre: 230 (exception: visual design majors). May be repeated.
- 690 Textile Design (3) I, II** **Havaas**
Individual problems in areas of specific interest within textile field. Seminars. Pre: consent of chairman and instructor. May be repeated.

VISUAL DESIGN (Art)

- 265 Advanced Visual Design (3) I**
Investigation into processes of visualization, its expression and control. Seminars. May be repeated.
- 266 Advanced Visual Design (3) II**
Design and communication. Projects closely bound to idiom and problems of our time; systems, grid, module, computer, symbol. Pre: 265.
- 361 Typography (3) I** **Staff**
Development of letter form in calligraphy and typography.
- 362 Letter Forms (3) II** **Staff**
Design and communication. The letter as visual symbol and element in design organization. Pre: 361.
- 663-664 Visual Communication (3-3) Yr.** **Staff**
Experimental problems of visual design which communicate. Creation of new images and symbols. Seminars. Pre: consent of chairman and instructor. May be repeated.
- 665 Advanced Typography (3) I** **Staff**
Individual problems in typography. Seminars. Pre: consent of chairman and instructor. May be repeated.
- 773-774 Visual Design Research (arr.) Yr.** **Staff**
Advanced design and communication. Emphasis on problem-solving incorporating research. Seminars. Pre: consent of chairman and instructor. May be repeated.

WEAVING (Art)

- 238 Weaving (3) I, II**
Creative processes of weaving. Warping and threading of simple hand looms and multiple harness looms. Seminars.
- 239 Weaving (3) I, II** **Staff**
Experimentation with techniques and study of pattern drafting. Designing for specific problems. Seminars. Pre: 238.

- 338-339 Advanced Weaving (3-3) Yr.** **Staff**
 Individual problems in weave construction and drafting; yarn and fiber characteristics as structural elements. Seminars. Pre: 239. May be repeated.
- 635 Rug and Tapestry Techniques (3) I, II** **Staff**
 Examination of traditional rug and tapestry techniques as point of departure for contemporary experimental expression. Seminars. Pre: consent of chairman and instructor. May be repeated.
- 638-639 Weaving (3-3) Yr.** **Staff**
 Individual problems in advanced weaving. Seminars. Pre: consent of chairman and instructor. May be repeated.

Asian and Pacific Languages

Professors ARAKI, DeFRANCES, ELBERT, LI, MARTIN, MAURER, UYEHARA, VIGLIELMO, YAO, YOUNG; Associate Professors DeHEER, IKEDA, P. LEE, LO, WINTERS; Assistant Professors BAUMER, R. CHENG, DARDJOWIDJOJO, FUJIKAWA, FUJIOKA, GETHING, HOFFER, OYAMA, SPENCER, TAHARA; Instructors ALEXANDER, CHAMBERLAIN, CHANG, H. C. CHENG, CHINN, HASEGAWA, JAGANNATH, C. H. JEN, S. M. JEN, JENNER, JOHNSON, KONNO, KUNISHIMA, LARRABEE, D. J. LEE, MAUKELE, NISHIMURA, O'HARROW, PARK, PeBENITO, PUGARELLI, ROFFE, M. SATO, Y. SATO, SHOJI, SUEHIRO, H. SUGITA, TAKAGAKI, TAKAHASHI, TAKEUCHI, TATEISHI, TSUYUKI, WAKITA, C. WANG, E. WANG, YAMADA, YAMAURA, M. YOSHIKAWA, YUNG; Scholars-in-Residence KUSANO, YAMAMOTO, ITO; Specialists SONG, KOBAYASHI, B. P. YOSHIKAWA

General (AP)

- 101-102 Directed Elementary Language Study (3-3) Yr.**
 Directed study of an Asian or Pacific language not regularly listed by the department. In principle, classes will meet 1 hour daily, Monday through Friday. Offering depending on demand and availability of staff. Pre: consent of instructor.
- 201-202 Directed Intermediate Language Study (4-4)**
 Continuation of 101-102. Pre: consent of instructor.
- 300 Directed Third-Level Language Study (3) I, II**
 Directed study of one of the Asian and Pacific languages involving advanced structures, expressions, patterns. Pre: consent of chairman.
- 361-362 Southeast Asian Literature (3-3) Yr.**
 Historical survey of Southeast Asian verse and prose in relation to Southeast Asian culture. Conducted in English. Pre: two semesters of literature in English department.
- 400 Directed Fourth-Level Language Study (3) I, II**
 Directed study of one of the Asian and Pacific languages involving complex structures, expressions, patterns. Pre: consent of chairman.
- 451-452 Structure of an Asian or Pacific Language (3-3) Yr.**
 Structure of an Asian or Pacific language, including Balinese, Cambodian, Cebuano, Fijian, Ilocano, Javanese, Korean, Lao, Marathi, Pali, Samoan, Tamil, Trukese. Urdu, Vietnamese or other Asian or Pacific language, depending on demand and staff. Pre: two levels of a Southeast Asian or Pacific language.
- 453-454 Survey of Southeast Asian Languages (3-3) Yr.**
 Introductory lecture course on history, spread, typology of the languages of Southeast Asia. Primarily for students of Southeast Asian languages. Pre: two levels of a Southeast Asian language.
- 493-494 Senior Honors Thesis (3-3) Yr.**
 Preparation of research paper under individual faculty supervision. Required for graduation with honors.
- 690 Directed Reading (arr.) I, II**
 Directed reading of advanced text written in one of the Asian and Pacific languages. Pre: consent of instructor.

699 Directed Research (arr.) I, II

Pre: consent of instructor.

761-762 Seminar in East Asian Comparative Literature (3-3) Yr.

Comparative study of Chinese, Korean, Japanese literature, to explore interrelations, to trace influence of one literature on another, and to investigate main currents, periods, movements, topics or themes. Pre: any of the following: Chinese 402 or 404, Japanese 402 or 462, Korean 402 or 462.

Chinese (Chin)**101-102 Elementary Chinese (3-3) Yr.**

Development of listening, speaking, reading, writing. Structural points introduced inductively. Meets 1 hour daily, Monday through Friday. Daily laboratory work.

103 Accelerated Elementary Chinese (6) I

Meets 2 hours daily, Monday through Friday, with daily laboratory drill. In one semester, content of 101-102 covered. Pre: consent of instructor.

105 Mandarin for Speakers of Cantonese (3) I

Rapid introduction to spoken Mandarin for students who already have some knowledge of Cantonese and the Chinese writing system. In one semester, content of Chinese 101-102 covered. Meets 1 hour daily, Monday through Friday. Daily laboratory work.

141 Introduction to Chinese Calligraphy (1) I, II

Practice in writing with a Chinese brush. Pre: credit or registration in 101 or equivalent.

142 Advanced Chinese Calligraphy (1) I, II

Introduction to various forms of cursive writing. Pre: 101.

201-202 Intermediate Chinese (4-4) Yr.

Continuation of 101-102. After completion, student should be proficient in using major sentence patterns. Meets 1 hour daily, Monday through Friday. Daily laboratory work. Pre: 102 or equivalent.

204 Accelerated Intermediate Chinese (8) II

Meets 2 hours daily Monday through Friday with daily laboratory drill. In one semester, content of 201-202 covered. Pre: consent of instructor.

206 Mandarin for Speakers of Cantonese (3) II

Rapid introduction to spoken Mandarin for students who already have some knowledge of Cantonese and the Chinese writing system. In one semester, content of 201-202 is covered. Meets 1 hour daily, Monday through Friday. Daily laboratory work.

301-302 Third-Level Chinese (3-3) Yr.

Emphasis on vocabulary building and extended mastery of sentence structures of modern Chinese through reading and related conversation. Pre: 202 or equivalent.

303 Accelerated Third-Level Chinese (6) I

In one semester, content of 301-302 covered. Pre: consent of instructor.

321-322 Chinese Conversation (3-3) Yr.

Systematic practice on everyday topics of conversation. Laboratory drill. Pre: 202 or equivalent.

361 Survey of Chinese Literature in Translation (3) I

Historical survey from the earliest times to present, with emphasis on analysis. Knowledge of Chinese not required.

401-402 Fourth-Level Chinese (3-3) Yr.

Extensive reading with emphasis on academic topics. Pre: 302 or 303.

404 Accelerated Fourth-Level Chinese (6) II

In one semester content of 401-402 covered. Pre: consent of instructor.

421-422 Advanced Chinese Conversation (3-3) Yr.

Systematic practice on academic topics of conversation. Laboratory drill. Pre: 202 and consent of instructor.

431-432 Chinese for Reading Knowledge (3-3) Yr.

Rapid reading of materials related to miscellaneous academic topics. Pre: consent of instructor.

433-434 Selected Readings in Chinese (3-3) Yr.

Selected readings in various discipline areas, with specific areas determined on basis of student interest and availability of staff. May be repeated for credit. Pre: consent of instructor.

435-436 Introductory Classical Chinese (3-3) Yr.

Analysis of basic structural patterns in classical Chinese through selected readings in various texts. Pre: 402 or equivalent, or consent of instructor.

437-438 Advanced Classical Chinese (3-3) Yr.

Advanced readings in classical texts. Pre: 436 or equivalent.

440 Chinese Composition (2) I, II

Training in modern Chinese composition. Pre: 402 or equivalent and consent of instructor.

451-452 Structure of Chinese (3-3) Yr.

Introductory study of phonology, morphology, syntax of Mandarin Chinese including some discussion of usage and linguistic geography. Pre: 202 or equivalent.

453-454 Study of Chinese Characters (2-2) Yr.

Study of origin, structure and evolution of Chinese characters. Pre: 402 and consent of instructor.

461-462 Introduction to Modern Chinese Literature (3-3) Yr.

Selected readings in major genres, with an emphasis on analysis. Pre: 361 and 402.

470 Language and Culture of China (3) II

Extensive exposure, chiefly through tape recordings, classroom conversation and outside readings, to the history, culture, and institutions of Chinese. Pre: 421-422 or equivalent.

490 Reference Materials for Chinese Studies (3) I, II

Reference materials required for Chinese studies. Pre: 302.

611-612 Contemporary Chinese Literature (3-3) Yr.

Representative works of leading modern novelists, poets, dramatists since 1919. Pre: 462.

613-614 Chinese Poetry (3-3) Yr.

Critical study of classical Chinese poetry in various forms. Pre: 436 or equivalent.

616 History of Chinese Literary Criticism (3) II

Survey of Chinese literary criticism from Confucius to 20th century. Pre: 436 or equivalent.

617 Traditional Chinese Fiction (3) I

Study of major novels of Yuan, Ming, Ch'ing periods. Pre: 436 or equivalent.

618 Traditional Chinese Drama (3) II

Study of major plays of Yuan, Ming, early Ch'ing periods (e.g. *Romance of the Western Chamber*, *The Peony Pavilion*, *The Peach Blossom Fan*). Pre: 436 or equivalent.

619-620 Chinese Etymology (3-3) Yr.

Advanced study of relation between Chinese language and writing system, study of characters on oracle bones and bronzes, evolution and reform of Chinese characters. Pre: 436 or equivalent.

631 Chinese Phonology (3) I

Phonological changes from Archaic Chinese through Ancient Chinese to Modern Chinese represented by Mandarin. Lectures in English. Pre: 452 or equivalent.

632 Chinese Dialects (3) II

Study of major Chinese dialects. Lectures in English. Pre: 452 or equivalent.

641 Contrastive Analysis of Mandarin and English: Phonology (3) I

Similarities and differences between English and Mandarin phonology. Pre: 452 or equivalent.

642 Contrastive Analysis of Mandarin and English: Morphology and Syntax (3) II

Similarities and differences between English and Mandarin morphology and syntax. Pre: 641.

643-644 Methodology in Teaching Chinese as a Second Language (3-3) Yr.

Identification and analysis of problems in language learning and language teaching. Practice in preparing and presenting lessons with materials based on comparative linguistics analysis, using audio-lingual approach. Teaching materials, teaching aids, test construction. Pre: 452 or equivalent.

651-652 Historical and Philosophical Texts (3-3) Yr.

Reading and critical analysis of selected writings from Han to Ch'ing periods. Pre: consent of instructor. May be repeated for credit.

693-694 Methods in Chinese Studies (3-3) Yr.

Main fields of research, special methods evolved, principal sources of bibliographical information. Pre: 438 or equivalent.

750 Research Seminar in Chinese (3) I, II

Specialization in (1) language, (2) literature, (3) teaching methods. Pre: consent of instructor. May be repeated.

800 Thesis Research (arr.) I, II

Pre: consent of instructor.

Hawaiian (Haw)

101-102 Elementary Hawaiian (3-3) Yr.

Development of listening, speaking, reading, writing. Structural points introduced inductively. Meets 1 hour daily, Monday through Friday. 4 out of 5 hours devoted to directed drill and practice. Daily laboratory work.

201-202 Intermediate Hawaiian (4-4) Yr.

Continuation of 102. Meets 1 hour daily, Monday through Friday. At least 3 out of 5 hours devoted to directed drill and practice. Reading of traditional texts. Daily laboratory work. Pre: 102 or equivalent.

301-302 Third-Level Hawaiian (3-3) Yr.

Continuation of 202. Conducted in Hawaiian. Advanced conversation and reading. Pre: 202 or equivalent.

361 Hawaiian Literature in English (3) I

Survey of traditional myths, legends, chants, songs, sayings conducted largely in English. Pre: 202 or equivalent.

401-402 Fourth-Level Hawaiian (3-3) Yr.

Advanced reading and discussion in Hawaiian. Pre: 302 or equivalent.

435-436 Hawaiian Translation (3-3) Yr.

Problems of translation of Hawaiian documents, legends, songs. Pre: 302 or equivalent.

452 Structure of Hawaiian (3) II

Detailed analysis of texts; contrastive analysis of Hawaiian and English as aid to prospective teachers of Hawaiian. Pre: 202 and Ling 202 or equivalent.

Hindi (Hindi)

101-102 Elementary Hindi (3-3) Yr.

Development of listening, speaking, reading, writing. Structural points introduced inductively. Meets 1 hour daily, Monday through Friday. At least 3 out of 5 hours devoted to directed drill and practice. Daily laboratory work.

201-202 Intermediate Hindi (4-4) Yr.

Continuation of 102. Meets 1 hour daily, Monday through Friday. At least 3 out of 5 hours devoted to directed drill and practice sessions. Daily laboratory work. Pre: 102 or equivalent.

301-302 Third-Level Hindi (3-3) Yr.

Continuation of 202. Conversation and advanced reading. Pre: 202 or equivalent.

Indonesian (Ind)

103 Accelerated Elementary Indonesian (6) I

Development of listening, speaking, reading, writing. Structural points introduced inductively. Meets 2 hours daily, Monday through Friday. 8 out of 10 hours devoted to directed drill and practice. Daily laboratory work.

204 Accelerated Intermediate Indonesian (8) II

Continuation of 103. Meets 2 hours daily, Monday through Friday. 8 out of 10 hours devoted to directed drill and practice. Daily laboratory work. Pre: 103 or equivalent.

303 Accelerated Third-Level Indonesian (6) II

Continuation of 204. Meets 6 hours a week. Study of modern written texts. Introduction of Arabic scripts. Laboratory work. Pre: 204 or equivalent.

404 Accelerated Fourth-Level Indonesian (6) II

Continuation of 303. Meets 6 hours a week. Conducted in Indonesian. Advanced conversation and reading. Reading includes hikayat literature in Arabic script. Pre: 303 or equivalent.

Japanese (Jap)

101-102 Elementary Japanese (3-3) Yr.

Development of listening, speaking, reading, writing. Structural points introduced inductively. Meets 1 hour daily, Monday through Friday; 4 out of 5 hours devoted to directed drill and practice. Daily laboratory work.

103 Accelerated Elementary Japanese (6) I

Meets 2 hours daily, Monday through Friday with daily laboratory drill. In one semester, content of 101-102 covered.

120 Elementary Japanese—Review: Spoken (3) I, II

For students who have 102 equivalent writing ability but lack spoken proficiency. Content similar to spoken aspect of 101-102. Meets 3 times a week. Laboratory.

130 Elementary Japanese—Review: Reading (3) I, II

For students who have 102 equivalent spoken ability but lack reading and writing proficiency. Content similar to reading and writing aspects of 101-102. Meets 3 times a week. Laboratory.

201-202 Intermediate Japanese (4-4) Yr.....

Continuation of 101-102. After completion, student should be proficient in using major sentence patterns. Meets 1 hour daily, Monday through Friday; 4 out of 5 hours devoted to directed drill and practice sessions. Daily laboratory work. Pre: 102 or equivalent.

204 Accelerated Intermediate Japanese (8) II

Meets 2 hours daily, Monday through Friday with daily laboratory drill. In one semester, content of 201-202 covered. Pre: 103 or equivalent.

301-302 Third-Level Japanese (3-3) Yr.

Study of modern spoken and written Japanese involving advanced structures, expressions, patterns, *kyooiku kanji*. Pre: 202 or equivalent.

303 Accelerated Third-Level Japanese (6) I

Study of modern spoken and written Japanese involving advanced structures, expressions, patterns, *kyoiku kanji*. In one semester, content of 301-302 covered. Pre: 204 or equivalent.

311-312 Japanese Aural Comprehension (3-3) Yr.

Building up comprehension ability by using aural practice through movies and other visual aids. Pre: 202 or equivalent.

321-322 Japanese Conversation (3-3) Yr.

Development of general oral-aural proficiency. Pre: 202 or equivalent.

331-332 Japanese for Reading Knowledge (3-3) Yr.

Reading course for those who are not Japanese majors but interested in developing skill in reading in their areas of research. Pre: 202 or equivalent.

340 Japanese Composition (2) I, II

Writing modern compositions following designated patterns, *kanji*, and themes. Pre: 202 or equivalent.

361 Japanese Literature in Translation—Traditional (3) I

Historical survey from earliest times to 1868, with emphasis on analysis. Knowledge of Japanese not required. Pre: two semesters of literature in English department.

362 Japanese Literature in Translation—Modern (3) II

Historical survey from 1868 to present, with emphasis on analysis. Knowledge of Japanese not required. Pre: two semesters of literature in English department.

401-402 Fourth-Level Japanese (3-3) Yr.

Study of modern spoken and written Japanese involving complicated structures, expressions, patterns, *tooyoo kanji*. Pre: 302 or equivalent.

404 Accelerated Fourth-Level Japanese (6) II

Study of modern spoken and written Japanese involving complex structures, expressions, patterns, *tooyoo kanji*. In one semester content of 401-402 covered. Pre: 303 or equivalent.

411-412 Advanced Japanese Aural Comprehension (3-3) Yr.

Building up advanced comprehension ability by using aural practice through movies and other audio-visual aids. Pre: 312 or equivalent.

421-422 Advanced Japanese Conversation (3-3) Yr.

Systematic practice in academic topics of conversation. Lab drill. Pre: 302 or equivalent.

431-432 Selected Readings in Japanese (3-3) Yr.

Rapid reading of material related to students' own areas of research or discipline. Pre: Japanese 332 or equivalent.

435-436 Introduction to Japanese Documentary and Epistolary Styles (3-3) Yr.

Systematic study of *kambun* and *sōrōbun* styles and training in reading of various styles of calligraphy. Pre: 402 or equivalent.

440 Advanced Japanese Composition (2) I, II

Writing advanced modern composition following designated patterns, *kanji*, and themes. Pre: 302 or equivalent.

451-452 Structure of Japanese (3-3) Yr.

Phonology, morphology, syntax of modern colloquial grammar. Pre: 202 or equivalent.

455-456 Topics in Japanese Grammar (3-3) Yr.

Analysis of topics in modern colloquial Japanese grammar. Pre: 302 or equivalent.

457-458 Japanese Grammar—Classical (3-3) Yr.

Detailed analysis of classical Japanese. Pre: 402 or equivalent.

461 Introduction to Modern Japanese Literature (3) I

Selected readings in major genres of post-1868 literature. Pre: 402 or equivalent and 362 (may be taken concurrently).

462 Introduction to Traditional Japanese Literature (3) II

Selected readings in major genres of pre-modern literature. Pre: 402 or equivalent and 361 (may be taken concurrently).

470 Language and Culture of Japan (3) I

Extensive exposure, chiefly through tape recordings, classroom conversation and outside readings, to the culture, history and institutions of Japan.

490 Reference Materials for Japanese Studies (3) I, II

How to find, use, and evaluate reference materials basic to Japanese studies. Pre: 302, 461 or equivalent.

491-492 Japanese Interpretation (3-3) Yr.

Training in techniques of summary, consecutive and simultaneous interpretation. English-Japanese, and Japanese-English. Pre: 402 or equivalent.

495-496 Japanese Translation (3-3) Yr.

Training in the techniques of translation ability, Japanese into English (English into Japanese).

609-610 Japanese Poetry (3-3) Yr.

Historical survey of poetical types including *tanka*, *haiku*, *senryuu*, *shi*, folk songs. Pre: 402 or equivalent.

611-612 Contemporary Japanese Literature (3-3) Yr.

Literary movements and representative works since 1868. Pre: 402, 461 or equivalent.

614 Edo Literature (3) II

Reading and critical analysis of prose literature of Edo Period. Pre: 464 or consent of instructor. May be repeated for credit.

615 Medieval Japanese Literature (3) I

Reading and critical analysis of prose literature of Kamakura and Muromachi periods. Pre: 464 or consent of instructor. May be repeated for credit.

616 Classical Japanese Literature (3) II

Reading and critical analysis of Heian Period prose literature. Pre: 464 or consent of instructor. May be repeated for credit.

621-622 History of Japanese Literary Criticism (3-3) Yr.

Survey of Japanese literary criticism from ancient times to 20th century. Pre: consent of instructor.

623 Japanese Folklore (3) I

Investigation of folk beliefs and customs, particularly as manifested in traditional literature and narrative literature. Pre: 361, 402 or equivalent.

631-632 History of the Japanese Language (3-3) Yr.

Study of change and growth of Japanese language from ancient to modern periods. Pre: 452 or equivalent.

633-634 Advanced Japanese Structure (3-3) Yr.

Advanced problems and discussion of theory in Japanese linguistics: syntax, morphology, and phonology.

641-642 Contrastive Study of Japanese and English Structure (3-3) Yr.

Study of similarities and differences between English and Japanese structures: phonology, morphology, syntax. Pre: 452 or equivalent.

643-644 Methodology in Teaching of Japanese as a Second Language (3-3) Yr.

Identification and analysis of problems in language learning and teaching. Practice in preparing and presenting lessons with materials based on comparative linguistic analysis, using audiolingual approach. Teaching materials, teaching aids and test construction. Pre: 452 or equivalent.

690 Japanese Bibliography (3) I, II

Advanced studies in historical survey of bibliographic material. Research methods. Pre: 490 or equivalent.

750 Research Seminar in Japanese (3) I, II

(1) Language, (2) literature, (3) teaching methods. Pre: consent of instructor. May be repeated.

800 Thesis Research (arr.) I, II

Consent of instructor.

Korean (Kor)

101-102 Elementary Korean (3-3) Yr.

Development of listening, speaking, reading, writing. Structural points introduced inductively. Meets 1 hour daily, Monday through Friday; 4 out of 5 hours devoted to directed drill and practice sessions. Daily laboratory work.

201-202 Intermediate Korean (4-4) Yr.

Continuation of 101-102. After completion, student should be proficient in using major sentence patterns. Meets 1 hour daily, Monday through Friday; 4 out of 5 hours devoted to directed drill and practice sessions. Daily laboratory work. Pre: 102 or equivalent.

301-302 Third-Level, Korean (3-3) Yr.

Advanced conversation, reading, writing. Additional Chinese characters. Pre: 202 or equivalent.

361 Korean Literature in Translation—Poetry (3) I

Historical survey, with emphasis on analysis and comparisons with Chinese, Japanese, Western poetry. Knowledge of Korean not required. Pre: two semesters of literature in English department.

362 Korean Literature in Translation—Prose (3) II

Historical survey, with emphasis on analysis and comparisons with Chinese, Japanese, Western literature. Knowledge of Korean not required. Pre: two semesters of literature in English department.

401-402 Fourth-Level Korean (3-3) Yr.

Introduction to classical and contemporary literary styles. Pre: 302 or equivalent.

461-462 Contemporary Korean Literature (3-3) Yr.

Detailed study of modern verse and prose in Korea, with emphasis on different movements and schools. Pre: 302 or equivalent.

490 Reference Materials for Korean Studies (3) I

Basic reference and bibliographic materials for Korean studies. Pre: 302 or equivalent.

495 Advanced Study and Senior Essay (2) I, II

Directed research in an area of Korean literature, linguistics, or dialects. Paper required. Pre: 402 or equivalent.

694 Reference Materials for Korean Studies (3) II

Basic reference and bibliographic materials for research and use in Korean studies. Pre: 402 or equivalent.

750 Research Seminar in Korean (3) I, II

Specialization in (1) language, and (2) literature. Pre: consent of instructor. May be repeated.

Sanskrit (Sansk)

351-352 Introduction to Sanskrit (3-3) Yr.

Introduction to Sanskrit grammar, and reading of classical texts. Pre: consent of instructor.

461-462 Readings in Sanskrit Classical Literature (3-3) Yr.

Continuation of 352. Reading of classical texts with grammar review. Pre: 352 or equivalent.

661-662 Advanced Readings in Sanskrit Literature (3-3) Yr.

Reading of Vedic and advanced classical texts. Pre: 462 or equivalent.

Tagalog (Tag)

103 Accelerated Elementary Tagalog (6) I

Development of listening, speaking, reading, writing. Structural points introduced inductively. Meets 2 hours daily, Monday through Friday. 8 out of 10 hours devoted to directed drill and practice. Daily laboratory work.

204 Accelerated Intermediate Tagalog (8) II

Continuation of 103. Meets 2 hours daily, Monday through Friday. 8 out of 10 hours devoted to directed drill and practice. Daily laboratory work. Pre: 103 or equivalent.

Thai (Thai)

103 Accelerated Elementary Thai (6) I

Development of listening, speaking, reading, writing. Structural points introduced inductively. Meets 2 hours daily, Monday through Friday. 8 out of 10 hours devoted to directed drill and practice. Daily laboratory work.

204 Accelerated Intermediate Thai (8) II

Continuation of 103. Meets 2 hours daily, Monday through Friday. 8 out of 10 hours devoted to directed drill and practice. Daily laboratory work. Pre: 103 or equivalent.

303 Accelerated Third-Level Thai (6) I

Continuation of 204. Meets 6 hours a week. Study of modern written texts. Laboratory work. Pre: 204 or equivalent.

404 Accelerated Fourth-Level Thai (6) II

Continuation of 303. Meets 6 hours a week. Study of advanced written texts. Advanced conversation. Pre: 303 or equivalent.

Asian Studies (Asian)

Professors BOWERS, HUNG, KORNHAUSER, NUNN, RIGGS, WIENS; Assistant Professor GETHING

301 Civilizations of the East (3) I

Nunn

Physical environment and cultural traditions of East, Southeast, South Asia, before major Western contact.

302 Civilizations of the East (3) II

Nunn

Response of Asian culture to the West; movements of nationalism and modernization; Asia's role today.

303-304 Discussion Lab and Essay (arr.) I, II

Nunn

Discussion of questions and problems raised in 301-302 lectures and a paper accounting for 1 unit of credit. Required of and restricted to Asian Studies majors. (Student should register for 2 credits the semester in which he intends to complete paper; 1 credit the other semester.)

341 Technics of Japanese Civilization (3)

Kornhauser

Consideration of man's interaction with his environment; interplay of tradition and change, evolution of social patterns, present economic organization. (Not offered 1969-70.)

- 798 Seminar in Asian Studies (3) I, II** **Staff**
 (1) East Asia, (2) Southeast Asia, (3) South Asia. Pre: consent of instructor.
- 799 Directed Research (arr.) I, II** **Staff**
 Individual problems and research. Pre: consent of instructor.
- 800 Thesis Research (arr.) I, II** **Staff**

Biological Sciences

Biology (Biol)

A program offered by the departments of Botany, Microbiology and Zoology.

Professor TOWNSLEY; Assistant Professors B. Z. SIEGEL, C. W. SMITH

- 220 Biology (5) I (3 L, 2 Lb)** **B. Siegel, C. W. Smith, S. Townsley**
 Fundamentals of biology. Devoted to study of microorganisms, lower and higher plants and animals with emphasis on their comparative physiology, development, behavior, evolution, systematics. Pre: concurrent registration or completion of Chem 243, 245 and Math 205.
- 250 Biology (4) II (3 L, 1 Lb)** **B. Siegel**
 Cell structure and function. Patterns and operation of biologic organization through which molecules, organelles, cells, and tissues give living organisms their basic properties. Pre: 220 or consent of instructor and concurrent registration or completion of Chem 244, 246.
- 401 Molecular Basis of Cell Function (2) II (2 L)** **Gibbons**
 Examination of relationship between structure and function at macromolecular level. Topics range from the properties of individual proteins to the organization of highly integrated molecular systems within cells. Pre: 250, Chem 243-246 or consent of instructor.
- 440 Environmental and Space Biology I (2) I (2 L)** **C. Folsome, S. Siegel**
 Conditions for organic existence and suitability of terrestrial and extraterrestrial environments; experimental simulation of extreme environments; concepts of space biology and human aspects of environmental biology. Pre: 220 and 250 or equivalent; Chem 243-246; and consent of instructor.

Botany (Bot)

Professors BAKER, COOIL, DOTY, KEFFORD, S. SIEGEL, A. SMITH; Associate Professors FRIEND, GOOS, LAMOUREUX, MUELLER-DOMBOIS, PUTMAN; Assistant Professors FOURNIER, LLOYD, C. SMITH; Instructor GAY

Biol 220 and Biol 250 are required of all majors.

- 101 General Botany (4) I, II (3 L, 1 Lb)** **Friend, Gay, Kefford**
 Growth, functions and evolution of plants; their relations to the environment and particularly to man and his activities. Designed for non-science majors; with permission of instructor, students with previous biological training may proceed to higher level course.
- 105 Ethnobotany (3) I** **Krauss**
 Plants and their influence upon culture of Hawaii and Pacific; uses of cultivated and wild plants.
- 160 Identification of Tropical Plants (2) II** **Lloyd**
 Non-technical course in identification of common plants of tropics. Not open to students who have had 360; not credited for botany major.

- 201 The Plant Kingdom (4) II (2 L, 2 Lb)** **C. Smith**
Comparative studies of structure and physiology of plants with reference to distribution and classification. Pre: 101 or Biol 220.
- 353 Ecology I (3) I (2 L, 2 Lb)** **Mueller-Dombois**
Plant-environmental relations (autecology) with emphasis on tropical conditions. Pre: 101 or Biol 220 or consent of instructor.
- 399 Botanical Problems (arr.) I, II** **Staff**
Limited to senior majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in botany. May be repeated.
- 410 Plant Anatomy (3) I (2 L, 1 Lb)** **Lamoureux**
Structure of vascular plants; origin and differentiation of tissues; relation of structure to function. Pre: 201 or equivalent. Recommended: 470.
- 412 Microtechnique (3) I, II (2 L, 1 Lb)** **Lamoureux**
Preparation of plant materials for histological and cytological study, photomicrography. Pre: 410 or consent of instructor.
- 430 Mycology (3) I (2 L, 2 Lb)** **Goos**
Morphology, physiology, ecology of fungi; their identification. Pre: 201 or Biol 220 or consent of instructor.
- 435 Experimental Mycology (3) II (2 L, 2 Lb)** **Goos**
Growth, development and reproduction of fungi as influenced by nutritional and environmental factors, with emphasis on experimental methods. Pre: 430 or Biol 250 or consent of instructor.
- 436 Medical Mycology (3) II (2 L, 2 Lb)** **Baker**
Diagnostic morphology and physiology of fungi pathogenic to man. Pre: 430 or Micro 351, or consent of instructor. (Not offered 1969-70.)
- 440 Environmental and Space Biology I (2) I (2 L)** **S. Siegel, C. Folsome**
Pre: Biol 220 and 250 or equivalent; Chem 243-246; and consent of instructor.
- 450 Natural History of the Hawaiian Islands (2) II (2 L-Lb)** **Lamoureux, Gosline**
Geography, geology, climatology, biotic environment of Pacific Basin and Hawaiian Islands; evolution of terrestrial biota of oceanic islands. Pre: one semester of biological science at college level. Identical with Zool 450.
- 454 Ecology II (4) II (2 L, 2 Lb)** **Mueller-Dombois**
Community ecology (synecology), ecological land classification, experimental ecology. Field trips to develop local examples. Pre: 101 or Biol 220 or consent of instructor.
- 461 Systematics of Vascular Plants (4) I (2 L, 2 Lb)** **Lloyd**
Principles of plant evolution, diversity, structure, and classification. Laboratory emphasizes plant identification and circumscription of plant families. Pre: 101 or Biol 220 or consent of instructor.
- 470 Principles of Plant Physiology (4) II (3 L, 1 Lb)** **Friend**
Introduction to plant physiology. Pre: 201 or Biol 220, Chem 114, 116, Phys 160, or equivalents with consent of instructor.
- 480 Phycology (3) II (1 L, 2 Lb)** **Doty**
Morphology, taxonomy, ecology of algae. Identification of common algae. Pre: 101 or Biol 220 or Zool 101 or Micro 351.
- 610 Botanical Seminar (1) I, II** **Staff**
Study and discussion of significant topics and problems in botany.
- 612 Advanced Botanical Problems (arr.) I, II** **Staff**
Investigation of any botanical problem; reading and laboratory work. Pre: consent of instructor. May be repeated.
- 615 Morphology Seminar (2) II** **Lamoureux**
Recent developments in morphology, anatomy, cytology. Pre: consent of instructor.
- 618 Cytology (3) I (2 L, 1 Lb)** **Sagawa**
Structure and function of cell components. Pre: Biol 250 or equivalent or consent of instructor.

- 620 Origin, Evolution and Distribution of Flowering Plants (4) I (3 L, 1 Lb) A. Smith**
Survey of evolutionary history of flowering plants and significance of their geographic distribution. Pre: 201 or Biol 220 or equivalent and consent of instructor. Recommended: 410, 461.
- 631 Marine Phytoplankton (3) I (2 L, 1 Lb) Fournier**
Identification, systematic morphology, autecology distribution and abundance. Pre: graduate standing or permission of instructor.
- 640 Environmental and Space Biology II (arr.) I, II S. Siegel**
Orientation towards experimentation with biological systems in extreme environments and individual investigations with such systems. Pre: graduate standing and consent of instructor.
- 650 Environmental Phytogeography (2) II Mueller-Dombois**
Plant geography and general ecology with emphasis on tropical areas. Pre: 101 or Biol 220 or equivalent or consent of instructor.
- 651 Dynamics of Marine Productivity (3) II (2 L, 1 Lb) Fournier**
Primary productivity, its variation and methods of assessment; conversion of energy in food chains, ecosystems; factors affecting productivity. Pre: graduate standing or permission of instructor.
- 662 Advanced Taxonomy (4) II (2 L, 2 Lb) Lloyd**
Principles of plant speciation and biosystematics with emphasis on modern techniques for gathering data. Pre: consent of instructor. (Alt. yrs.; offered 1969-70.)
- 665 Nomenclature Seminar (2) II Doty**
Code of botanical nomenclature and its application, determination of correct scientific names. Pre: 461. (Alt. yrs.; offered 1969-70.)
- 670 Plant Nutrition and Water Relations (3) I (3 L) Cooil**
Plants in relation to water and nutrient elements; absorption and translocation of water and solutes in plants. Pre: 470, Chem 244, Phys 161.
- 671 Energetics and Biosynthesis in the Plant Kingdom (3) II (3 L) S. Siegel**
Comparative and synthetic aspects of natural products in plant kingdom, their distribution, bioenergetic relationships and metabolism. Pre: Chem 244, Biol 250 or equivalent. (Alt. yrs.; offered 1969-70.)
- 672 Techniques in Physiology (2) I (2 Lb) Staff**
Nutrient absorption and composition; osmotic relations. Pre: 470, Chem 244, Phys 161, consent of instructor.
- 673 Techniques in Physiology-Biochemistry (2) II (2 Lb) Putman**
Determining substances of physiological significance in plant materials. Pre: 672, consent of instructor.
- 675 Physiology Seminar (1) I, II Staff**
Significant topics and problems in physiology. May be repeated. Pre: consent of instructor.
- 681 Phycology—Chlorophyta (2) I (2 Lb) Doty**
Systematics, functions and utilization considered at advanced level. Pre: consent of instructor. (Alt. yrs.; not offered 1969-70.)
- 682 Phycology—Phytoplankton (2) II (2 Lb) Doty**
Systematics, functions and utilization considered at advanced level. Pre: consent of instructor. (Alt. yrs.; not offered 1969-70.)
- 683 Phycology—Myxophyta and Phaeophyta (2) I (2 Lb) Doty**
Systematics, functions and utilization considered at advanced level. Pre: consent of instructor. (Alt. yrs.; offered 1969-70.)
- 684 Phycology—Rhodophyta (2) II (2 Lb) Doty**
Systematics, functions and utilization considered at advanced level. Pre: consent of instructor. (Alt. yrs.; offered 1969-70.)
- 699 Directed Research (arr.) I, II Staff**
Pre: candidacy for M.S. degree; consent of instructor.

- 799 Directed Research (arr.) I, II** **Staff**
 Pre: candidacy for Ph.D. degree; consent of instructor.
- 800 Thesis Research (arr.) I, II**

Microbiology (Micro)

Professors BENEDICT, CHU, CONTOIS, FOLSOME, HERZBERG, LOH; **Associate Professors** BERGER, HALL, GUNDERSEN; **Assistant Professors** BAUMANN, SIEGEL

Biology 220 and Biology 250 are required of all students majoring in Microbiology. Microbiology 351 is prerequisite to all more advanced courses.

- 130 General Bacteriology (3) I, II** **Baumann**
 Fundamentals of bacteriology with emphasis on microorganisms as they affect people and their possessions. Not open to those who have credit in 351.
- 140 Microbiology Laboratory (1) I (1 Lb)** **Loh**
 Primarily for students in nursing and dental hygiene. Pre: credit or registration in 130; Chem 113-115.
- 351 Prokaryotic Biology (3) I, II (2 L, 2 Lb)** **Berger, Baumann**
 Study of bacteria: their anatomy, chemistry, physiology and development; their roles in natural processes. Pre: Biol 250; Chem 241-242 or 244, 246; or consent of instructor; Math 205 desirable.
- 431 Microbial Biochemistry and Function (4) I (3 L, 2 Lb)** **Hall**
 Fundamental physiological and metabolic processes of microorganisms with emphasis on growth, synthesis of cellular constituents, energy-yielding processes. Pre: 351; credit or registration in Math 206; general biochemistry; or consent of instructor.
- 461 Immunology (4) I (3 L, 2 Lb)** **Benedict**
 Structure and biological actions of antigens and antibodies; fundamentals of antibody production. Pre: 351; Math 205; or consent of instructor; Bioch 441 or Ag Bioch 402 desirable.
- 463 Microbiology of the Pathogens (4) II (3 L, 2 Lb)** **Herzberg**
 Host-parasite relationships in microbial diseases of man and animals. Characteristics of bacterial pathogens. Basic techniques of isolation, identification, diagnosis. Pre: 351, 461.
- 475 Microbial Genetics (4) II (2 L, 2 Lb)** **Folsome**
 Genetic analysis and molecular basis of transmission, replication, mutation, segregation, expression of heritable characteristics in prokaryotes and unicellular eukaryotes. Pre: 351 or Biol 250 and consent of instructor; Math 206.
- 480 Microbial Ecology (4) I (2 L, 2 Lb)** **Gundersen**
 Interactions between microorganisms and between microorganisms and other organisms in nature. Pre: 351 or consent of instructor.
- 490 Virology (4) II (2 L, 2 Lb)** **Loh**
 Basic concepts of animal virology involving a comparative consideration of the physical, chemical, and biological properties of representative animal virions. Laboratory: emphasis on the use of animal tissue culture systems. Pre: 351, 461; Bioch 441; or consent of instructor.
- 499 (399) Microbiological Problems (arr.) I, II** **Staff**
 Directed reading and research. Limited to senior majors with 2.7 grade-point ratio, or 3.0 in microbiology.
- 625 Immunochemistry (3) II (3 L)** **Benedict**
 Detailed reports and discussions on selected advanced topics and current research literature in immunochemistry. Pre: 461; Bioch 601; or consent of instructor. (Alt. yrs; offered 1969-70.)
- 632 Advanced Microbial Physiology (3) II (3 L)** **Berger**
 Selected topics. Pre: 431 or consent of instructor. (Alt. yrs; offered 1970-71.)

- 642 Marine Microbiology (3) II (3 L)** **Gundersen**
Microbial activities in sea; taxonomy; ecology and physiology of marine pelagic and benthic microorganisms. Pre: 431; Ocean 620, 621, 622, or 623; or consent of instructor. (Alt. yrs; offered 1969-70.)
- 655 Virology (3) I (3 L)** **Loh**
Detailed reports and discussions on selected advanced topics and current research literature in virology. Pre: 463, 490; Bioch 441 or 601; and consent of instructor. (Alt. yrs; offered 1970-71.)
- 661 Ultrastructure of Microorganisms (3) I (3 L)**
Structural and molecular architecture of cell organelles; concepts of cellular integration. Pre: consent of instructor.
- 665 Electron Microscopy (2) II (2 Lb)**
Introduction to use of electron microscope and preparative techniques. Pre: 661 and consent of instructor.
- 671 Microbial Genetics (3) I (3 L)** **Folsome**
Directed study and discussion of research literature dealing with bacterial and bacterial virus mutation, genetic recombination, evolution and control mechanisms. Pre: 475; Bioch 601; and consent of instructor (Alt. yrs; offered 1969-70.)
- 675 Exobiology (3) II (3 L)** **Folsome**
Advanced introduction to literature dealing with the detection of extraterrestrial life, the basic organic chemistry pertinent to the origin-of-life problem, and the construction of exotic ecological systems. Pre: Chem 351, Biol 440.
- 681 Host-Parasite Relationships (3) I (3 L)** **Herzberg**
Mechanisms of pathogenicity of microorganisms and defense mechanisms of human and animal hosts. Review of contemporary literature. Pre: 463 or consent of instructor. (Alt. yrs; offered 1969-70.)
- 690 Seminar (1) I, II** **Herzberg, Loh**
Significant topics in microbiology. Required of graduate students. May be repeated.
- 699 Directed Research (arr.) I, II** **Staff**
Selected problems in microbiology. Pre: consent of instructor.
- 795 Special Topics in Microbiology (arr.) I, II**
Selected topics in any aspect of microbiology. May be repeated.
- 800 Thesis Research (arr.)** **Staff**

Zoology (Zool)

Senior Professors HIATT, TESTER; Professors BANNER, BERGER, CHU, GOSLINE, HSIAO, KAMEMOTO, MATTHEWS, TOWNSLEY, VAN WEEL; Associate Professors REED, REESE; Assistant Professors BAILEY, BRANHAM, EBERT, HALEY, POPPER, STEVENS

Biology 220 is required by all students majoring in Zoology.

- 101 Principles of Zoology (4) I, II (3 L, 1 Lb)** **Reed**
Introduction to zoology. Living animals, their structure, development, reproduction, derivation, habits, ecology, with emphasis on their relationship to man and society.
- 310 Invertebrate Zoology (3) I (2 L, 1 Lb)** **Banner**
Morphology, evolution, systematics, ecology, life history of invertebrate phyla.
- 320 Vertebrate Zoology (4) II (2 L, 2 Lb)** **Hsiao**
Classification, evolution, functional anatomy, and development of vertebrates.
- 330 Principles of Ecology (2) I** **Ebert**
Distribution and abundance of organisms discussed in relation to physical, physiological, population and community parameters.
- 340 Parasitology (3) II (2 L, 2 Lb)** **Chu**
Parasitology with reference to man and domestic animals; classification, comparative morphology, life history, control.

- 416 Histology (3) I (2 L, 2 Lb)** **Hsiao**
Studies of tissues, principles of histology, and microscopic anatomy of limited number of vertebrate animals.
- 417 Microtechnique (3) I (2 L-Lb)** **Matthews**
Fixing, staining, mounting of tissues, entire animals and organs.
- 420 Embryology (4) I (3 L, 1 Lb)** **Haley**
Descriptive and analytical embryology of selected vertebrates and invertebrates.
- 430 Animal Physiology (3) I (2 L, 2 Lb)** **Stevens**
Properties of protoplasm; functions of organ systems, fundamental principles.
- 435 Endocrinology (2) II** **Kamemoto**
Anatomy and physiology of the organs of internal secretion, role of hormones in metabolism and development.
- 441 History of Zoology (2) II** **Banner**
Development of zoological science as specialized field of human knowledge.
- 450 Natural History of Hawaiian Islands (2) II (2 L-Lb)** **Gosline, Lamoureux**
Geography, geology, climatology, biotic environment of Pacific Basin and Hawaiian Islands; evolution of terrestrial biota of oceanic islands.
- 460 Avian Biology (3) II (2 L, 1 Lb)** **Berger**
Introduction to anatomy, physiology, annual cycle, behavior, distribution, taxonomy of birds; special attention given to Hawaiian and oceanic birds.
- 465 General Ichthyology (3) I** **Gosline**
Anatomy, physiology, ecology, distribution.
- 470 Limnology (3) II (2 L-Lb)** **Maciolek**
Biology, physics, chemistry of lakes, streams, estuaries, including field and laboratory techniques. (Alt. yrs.; offered 1969-70.)
- 480 Animal Evolution (2) II** **Staff**
Processes of evolution; interaction between population genetics and natural selection in animals. Desirable preparation: Genetics 451.
- 490 General Zoology Seminar (1) I, II** **Staff**
Reports on research or reviews of literature. Pre: senior standing. Required of students majoring in zoology or entomology.
- 493-494 Senior Honors Thesis (2-2) Yr.** **Staff**
- 499 Directed Reading or Research (arr.) I, II** **Staff**
Limited to senior majors with 2.7 grade-point ratio or 3.0 grade-point ratio in zoology.
- 603 Zoogeography (2) I** **Gosline**
Animal distributions; physiographic, climatic, and historic factors.
- 605 Comparative Endocrinology (4) I (3 L, 2 Lb)** **Kamemoto**
Biology of hormonal mechanisms, with emphasis on invertebrates and lower vertebrates. Lecture only may be taken for 3 credits.
- 606 Animal Behavior (3) II (2 L, 2 Lb)** **Reese**
Orientation and the ethological approach are stressed; behavioral physiology and learning theory are included.
- 608 Growth and Form (4) II (2 L, 2 Lb)** **Haley**
Analysis of normal growth patterns. Regulating mechanisms of normal growth, differentiation and influence of environmental factors.
- 609 Biology of Symbiosis (4) I (2 L, 2 Lb)** **Staff**
Obligatory and facultative relationships between animal species, including mutualism, commensalism, and parasitism, examined from structural and physiological viewpoints.
- 610 Topics in Developmental Biology (arr.) I, II** **Staff**
Discussion and survey of literature pertaining to specific topics in developmental biology.

- 611 Principles of Systematic Zoology (3) I** **Gosline**
Taxonomic categories; processes of evolution in their development; taxonomic data; rules of nomenclature.
- 620 Marine Ecology (3) II (2 L, 2 Lb)** **Ebert**
Principles of ecology are discussed in relation to marine biota and environment.
- 622 Isotopic Tracers in Biology (3) II (2 L, 1 Lb)** **Townsley**
Chemical and physical features of radioactive isotopes used in biological work. Methods of detection; application to biological systems.
- 629 Methods of Fisheries Investigation (3) I** **Staff**
Determining age, growth, spawning success, life history of fish; emphasis on marine species of the Pacific.
- 631 Biometry (3) I (2 L-Lb)** **Tester**
Elementary statistical methods; confidence interval, chi-square, t-test, normal distributions, regression, correlation.
- 632 Advanced Biometry (3) II (2 L-Lb)** **Tester**
Analysis of variance and covariance, curvilinear regression, multiple correlation, design of experiments. Pre: 631.
- 646 Comparative Invertebrate Physiology (3) II (2 L-Lb)** **van Weel**
Life processes, with emphasis on marine invertebrates.
- 666 Advanced Ichthyology (3) II** **Gosline**
Classification with reference to Hawaiian species.
- 691 Seminar in Zoology (1), I, II** **Staff**
Reports on research or reviews of literature. Graduate students required to take this course or one Topics course per year.
- 699 Directed Research (arr.) I, II** **Staff**
Directed research and reading in various fields of zoology.
- 702 Preparation of Scientific Manuscripts (1) I** **Berger**
Use of bibliographical tools; styles and methods of preparation for publication. Required of all students for Ph.D. degree in zoology or entomology.
- 715 Topics in Invertebrate Zoology (3) I, II (2 L, 2 Lb)** **Staff**
Comparative morphology, development, taxonomy, and phylogeny of invertebrate taxa.
- 716 Topics in Fish and Fisheries Biology (3) II** **Staff**
Lecture-discussion of various aspects of fish and fisheries biology.
- 718 Topics in Animal Physiology (3) II** **Staff**
Selected problems in general physiology, physiological ecology, electrophysiology, or neurophysiology. Basic concepts and measurements of function at the organismic or cellular level in animals.
Spring 1970: Physiological ecology. Physiological adaptations to environment: respiration, circulation, nutrition, reproduction, etc.

Chemistry (Chem)

Professors INSKEEP, NAUGHTON, SCHEUER, ZEITLIN; Associate Professors DUCE, IHRIG, KIEFER, LARSON, LIU, MANN, McDONALD, SCHALEGER, WAUGH; Assistant Professors ANDERMANN, BOPP, BUDDMEYER, CRAMER, GILJE, HUBBARD, MOORE, SEFF

- 113-114 General Chemistry (3-3) Yr. (3 L)**
Fundamental laws, principles, methods. Pre: high school algebra and plane geometry.
- 115 General Chemistry Laboratory (1) I (1 Lb)**
Experiments illustrating fundamental principles of chemistry. Pre: credit or registration in 113.

CHEMISTRY

116 General Chemistry Laboratory (1) II (1 Lb)

Continuation of 115. Pre: 115, credit or registration in 114.

117 Principles of Chemistry (4) I, II (4 L)

Principle, theories, elementary analytical methods. Pre: high school chemistry, credit or registration in 118, and Math 205.

118 Principles of Chemistry Laboratory (1) I, II (1 Lb)

Principles, techniques, elementary analytical methods. Pre: credit or registration in 117.

133 Elementary Quantitative Analysis (2) I, II (2 L)

Beginning gravimetric and volumetric analysis. Pre: 114, 116 or 117, 118.

134 Elementary Quantitative Analysis Laboratory (2) I, II (2 Lb)

Gravimetric and volumetric analysis. Pre: credit or registration in 133.

141 Elements of Organic Chemistry (3) II (3 L)

Primarily for students in dental hygiene program. Pre: 113-115. Note: those who have credit in 114 or 117 must enroll in 241.

142 Elements of Organic Chemistry Laboratory (1) II (1 Lb)

Laboratory techniques. Pre: 115 and credit or registration in 141.

241 Survey of Organic Chemistry (3) II (3 L)

Structure, nomenclature, properties, reactions of organic compounds emphasizing those of practical importance in related fields. Pre: 114, 116 or 117, 118.

242 Survey of Organic Chemistry Laboratory (1) II (1 Lb)

Techniques of preparation, purification, identification of organic compounds. Pre: 116 or 118 and credit or registration in 241.

243-244 Organic Chemistry (3-3) Yr. (3 L)

Carbon compounds. Topics include molecular structure, stereochemistry, nuclear magnetic resonance, reactions and methods of preparation of principal classes of organic compounds. Pre: 114, 116 or 117, 118.

245 Organic Chemistry Laboratory (1) I (1 4-hr. Lb)

Techniques of organic chemistry. Synthesis and qualitative analysis. Applications of spectroscopy. Chromatography. Pre: credit or registration in 243.

246 Organic Chemistry Laboratory (1) II (1 4-hr. Lb)

Continuation of 245. Pre: 245, credit or registration in 244.

333 Intermediate Quantitative Analysis (4) I (2 L, 2 Lb)

Introductory instrumental analysis. Pre: 134, credit or registration in 351.

351-352 Physical Chemistry (3-3) Yr. (3 L)

Principles and theories; physico-chemical procedures. Pre: 114, 116 or 117, 118, Math 206, Phys 272-273.

353 Physico-Chemical Measurements (2) II (2 Lb)

Modern laboratory techniques. Pre: 333, GE 251, credit or registration in 352.

399 Directed Reading or Research (arr.) I, II

Limited to majors with 2.7 grade-point ratio or 3.0 grade-point ratio in chemistry. May be repeated.

422 Intermediate Inorganic Chemistry (3) II

Classification, description, fundamental theory. Pre: credit or registration in 352.

424 Preparative Inorganic Chemistry (3) II (1 L, 2 Lb)

Preparation, properties, selected reactions of representative inorganic compounds. Pre: credit or registration in 422.

444 Qualitative Organic Analysis (4) I (2 L, 2 Lb)

Identification and characterization of organic compounds and mixtures. Pre: 134, 246, credit or registration in 351.

445 Intermediate Organic Chemistry (4) II (2 L, 2 Lb)

Modern synthetic methods. Pre: 246.

493-494 Senior Honors Thesis (2-2) Yr.

Research problem under individual faculty supervision. Required for graduation with honors in departmental honors program.

621 Introductory Quantum Chemistry (3) I

Principles of quantum mechanics with application to atoms and molecules. Molecular quantum mechanical descriptions of the chemical bond. Pre: 352.

622 Advanced Inorganic Chemistry I (3) II

Principles of modern inorganic chemistry. Pre: 621.

623 Advanced Inorganic Chemistry II (3) I

Principles of modern inorganic chemistry. Pre: 621.

631 Instrumental Methods of Analysis (4) I (2 L, 2 Lb)

Theory, instrumentation, applications. Pre: 333.

632 Electroanalytical Chemistry (3) II

Advanced electroanalytical determinations, theory, instrumentation. Pre: 333.

633 Introduction to Spectroscopy (3) II

Spectrochemical determinations, theory, instrumentation. Pre: 621, 631.

641-642 Advanced Organic Chemistry (3-3) Yr.

Structure, stereochemistry, reaction mechanisms. Pre: 244, 352.

651 Intermediate Physical Chemistry I (3) I

Chemical thermodynamics. Pre: 352.

652 Intermediate Physical Chemistry II (3) II

Chemical reaction kinetics. Pre: 651.

655 Radiochemistry and Nuclear Reactions (3) I

Nuclear models, radioactive decay processes, interaction of radiation with matter, nuclear phenomena. Pre: 352.

656 Radiochemical Techniques (1) I (Lb)

Modern radiochemical practice; use of isotopes as tracers and in activation analyses. Pre: credit or registration in 655.

691-692 Seminar (1-1) Yr.

Current topics in chemistry. May be repeated.

721-722 Special Topics of Inorganic Chemistry (arr.) I, II

Theory and application of modern inorganic chemistry. Pre: consent of instructor. May be repeated.

731-732 Special Topics in Analytical Chemistry (arr.) I, II

Theory and application of modern analytical chemistry. Pre: consent of instructor. May be repeated.

741-742 Special Topics of Organic Chemistry (arr.) I, II

Theory and application of modern organic chemistry. Pre: consent of instructor. May be repeated.

744 Organic Applications of Spectroscopy (3) II

Interpretation of IR, UV, NMR and mass spectra of organic compounds. Pre: 444, 641.

751-752 Special Topics of Physical Chemistry (arr.) I, II

Theory and application of modern physical chemistry. Pre: consent of instructor. May be repeated.

753 Quantum Chemistry (3) I

Review of basic principles of quantum mechanics, with emphasis on matrix representation of operators important to molecular structure theory. Application of the formalism to modern theories of chemical bond. Pre: 621.

756 Statistical Mechanics (3) II

Principles of statistical mechanics and statistical thermodynamics, with applications to chemical systems. Pre: 621, 651, suggested Math 232.

DRAMA AND THEATRE

758 Crystallography (3) II (3 L)

Crystal symmetry. Elementary x-ray physics. Diffraction theory and its applications to crystal and molecular structure determination. Pre: 232 or equivalent.

799 Directed Research (arr.) I, II

Pre: consent of department chairman. May be repeated.

800 Directed Research (arr.) I, II

Pre: candidacy for M.S. or Ph.D. degree; consent of thesis chairman.

Drama and Theatre (Drama)

Senior Professor ERNST; Professors BRANDON, TRAPIDO; Associate Professors LANGHANS, R. MASON; Assistant Professors CANNON, CARROLL, KAYA, LEV, MACQUEEN, SCHAUB, WOLZ; Lecturer SASA

160 or 260 and 240 are prerequisites to all courses in direction, design, stagecraft, and lighting.

160 Introduction to Drama and Theatre (3) I, II

Representative plays studied as illustrative of changing forms in the theatre and dramatic literature.

221-222 Beginning Acting (3-3) Yr.

Cannon

Individual exercises and group rehearsals with emphasis on voice, movement, relaxation. Students must perform in direction class scenes.

240 Basic Stagecraft and Stage Lighting (3) II

Trapido

Introduction to theory and practice of stagecraft and lighting.

260 Dramatic Production (3) I

Trapido

Introduction to process of converting the play into the performance.

281-282 Beginning Modern Dance (3-3) Yr.

Introduction to basic technical skills and creative processes.

283-284 Beginning Ballet (3-3) Yr.

Sasa

Introduction to the vocabulary of movement of classical ballet.

299 Theatre Practice (3) I, II

Supervised work in one or two areas: stagecraft, lighting, costuming, make-up. Term paper required. May be repeated.

321-322 Intermediate Acting (3-3) Yr.

MacQueen

Emphasis upon individual work in characterization and improvisation. Students must perform in direction class scenes. Pre: 221-222 or consent of instructor.

330 Direction (3) I

MacQueen

Readings, reports, discussion of theory and practice of stage direction.

340 Advanced Stagecraft (3) I

Schaub

Principles applied, techniques employed, in contemporary staging.

350 Design in the Theatre (3) I

Mason

Principles of design as related to scenery, costume, lighting for the stage.

352 Costume for the Stage (3) II

Mason

Survey of historical costume, with special emphasis on translation of historical styles into theatrical form.

370 Creative Dramatics (3) I, II

Kaya

Intensive study of dramatic activities for children and young people. Designed for teachers, group workers, recreation majors, others dealing with children. May be repeated.

372 Drama in Performance (3) II

Cannon

Study of plays as scripts for performance.

- 381-382 Intermediate Modern Dance (3-3) Yr.** **Wolz**
Development of flexibility, control, rhythm, and expressiveness. Pre: 281-282 or consent of instructor.
- 383-384 Intermediate Ballet (3-3) Yr.** **Sasa**
Training in standard ballet combinations. Pre: 283-284 or consent of instructor.
- 388 Dance Composition (3) II** **Wolz**
Study of techniques and materials used in composing dances. May be repeated.
- 410 Theatre Management (3) II** **MacQueen**
Business organization, management, public relations as practiced in professional, university, community, secondary school theatres.
- 421-422 Advanced Acting (3-3) Yr.** **Cannon**
Intensive work on technique; introduction to historical styles. Students must perform in direction class scenes. Pre: 321-322 or consent of instructor.
- 440 Advanced Stage Lighting (3) II** **Schaub**
Tools and techniques of lighting; emphasis on design process.
- 461-462 History of the Theatre (3-3) Yr.** **Langhans**
Survey of development of the theatre from ancient times to present.
- 464 Oriental Drama and Theatre: India and Southeast Asia (3) I** **Brandon**
Principal forms of drama in India and Southeast Asia and manner of production in the theatre. Pre: consent of instructor.
- 465 Oriental Drama and Theatre: China and Japan (3) I** **Brandon**
Principal forms of drama in China and Japan and manner of production in the theatre. Pre: consent of instructor.
- 468 Dance History (3) I** **Wolz**
Survey of styles of dance in the West from ancient times to 20th century.
- 474 Children's Theatre (3) I, II** **Kaya**
Theories and principles of formal theatre for children. Study of selection, direction, production of plays. Pre: 240 and 260.
- 476 Puppetry (3) I, II** **Kaya**
Survey of history and scope of puppetry. Construction and presentation of puppets for adult and child audiences. May be repeated.
- 481-482 Advanced Modern Dance (3-3) Yr.** **Wolz**
Emphasis upon performance of complete dances. Pre: 381-382 or consent of instructor. May be repeated.
- 483-484 Advanced Ballet (3-3) Yr.** **Sasa**
Emphasis upon performance of complete dances. Pre: 383-384 or consent of instructor. May be repeated.
- 490 Playwriting (3) I** **Carroll**
One-act plays; practice in writing in dramatic form; possibility of production. May be repeated. Pre: 3.0 grade point in English composition.
- 492 Advanced Playwriting (3) II** **Carroll**
Full-length plays and experimental writing in dramatic form. Pre: 490 or equivalent.
- 499 Directed Work (arr.) I, II**
Limited to senior majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in drama and theatre.
- 610 Seminar in Theatre Research (3) I** **Langhans**
Bibliography and research methods; fundamentals of thesis and dissertation writing. Required of all Master's candidates.
- 620 Advanced Acting Techniques (3) II** **MacQueen**
Individual and group exercises in stage movement and line reading. Research and reports on styles of acting. May be repeated.

ECONOMICS

- 631-632 Seminar in Direction (3-3) Yr.** Cannon, MacQueen
Directorial analysis of plays of different styles and periods; exercises; preparation of prompt books.
- 640 Problems in Stagecraft and Stage Lighting (3) II** Trapido
Special topics in staging and lighting of plays, and in planning and use of various types of modern theatres.
- 650 Advanced Design (3) II** Mason
Advanced study, analytical and creative, of visual aspects of dramatic art. Pre: 350.
- 660 Theories of the Theatre (3) I** Carroll
Theories of production, from Aristotle to Brecht.
- 662 Seminar in Drama and Theatre (3) II**
Special topics in Western theater.
- 664 Seminar in Oriental Theatre (3) II** Brandon
(1) India and Southeast Asia. (2) China and Japan. Pre: consent of instructor.
- 699 Advanced Theatre Practice (3) I, II**
Special projects in one or two areas: stagecraft, lighting, costuming, make-up. Term paper required. May be repeated.
- 730 Seminar in Direction (3) I** MacQueen
Organizational and artistic processes of the director. Pre: 631-632.
- 750 Seminar in Design (3) I** Mason
Design projects emphasizing conversion of historic materials to use in the theatre. Pre: 650.
- 760 Seminar in Aesthetics of the Theatre (3) II** Ernst
Consideration of the theatre as an art form.
- 799 Directed Work (arr.) I, II** Staff
Reading or research in theatre theory or history; reading and practice in particular areas of dramatic production. Pre: consent of instructor.

Economics (Econ)

Professors GORTER, HUNG, KAMINS, OSHIMA, SHAW; Associate Professors, CAMPBELL, COMITINI, MIKLIUS, NAYA, YEH; Assistant Professors ASHBY, CHAU, HAINES, HIGHT, LIM, POLLOCK; Acting Assistant Professors ABUDU, BURCROFF, COFFMAN, EBEL, LEFTON, TAWIL; Professor MILLER; Acting Assistant Professor MONCUR; Lecturers MARK, TEMPLE

- 120 Introduction to Economics (3) I, II** Staff
One-semester course for non-majors. Provides general understanding of functioning of economic systems, including various approaches to organization of production and allocation of resources, and of policies designed to achieve national economic goals.
- 150 Principles of Economics (3) I, II** Staff
Analysis of functioning of economic systems with emphasis on forces determining levels and changes of national income and employment. Describes basic economic institutions, e.g., markets, money, banks, labor organizations, corporations.
- 151 Principles of Economics (3) I, II** Staff
Analysis of how commodity and factor prices are determined. Discusses policies for efficient allocation of scarce resources. Required of all economics majors.
- 300 Intermediate Economic Theory: National Income (3) I, II** Ebel, Yeh
Concepts; determination of income, employment, price levels; effects of fiscal, monetary, other policies. Pre: 150.
- 301 Intermediate Economic Theory: Price Theory (3) I, II** Burcroff, Hung
Price determination and resource allocation under competition, monopoly, oligopoly, monopolistic competition. Theories of demand, cost, partial, general equilibrium. Pre: 151.

321 Elementary Statistics (3) I, II**Staff**

Basic elements of statistics, with emphasis on application: graphic presentation, logarithmic scales, rates and ratios, time series analysis, index numbers, regression and correlation analysis.

340 Money and Banking (3) I, II**Ashby, Lefton**

Nature and role of money; development of national and international monetary standards; role of commercial banking and financial intermediaries; development and function of central banking. Pre: 150.

399 Directed Reading (arr.) I, II**Staff**

Limited to senior majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in economics, on recommendation of department chairman only.

400 Growth and Fluctuations (3) II**Campbell**

Rigorous analysis of factors underlying economic growth and fluctuations in advanced countries and role of government in influencing economic activities. Studies various growth models and their implications. Pre: 300.

404 History of Economic Thought (3) I**Lefton**

Survey of economic thought from Adam Smith to present with emphasis on theory of value and distribution. Pre: 300, 301.

405 Comparative Economic Systems (3) I**Abudu**

Analysis of structure, institutions, operation, performance, growth of private enterprise, socialist, communist and mixed economies with emphasis on U.S., U.S.S.R. and underdeveloped economies. Pre: 150, 151 or consent of instructor.

410 Economic Development (3) I**Haines, Tawil**

Study of characteristics of underdeveloped economies, theories of economic growth, strategies of economic development, and investment criteria. Pre: 150, 151 or consent of instructor.

411 Economic Development of Europe (3) I

Study of economic growth and changes in economic institutions of Europe and U.S.S.R. since Industrial Revolution. Pre: 150, 151.

412 Economic Development of U.S. (3) II

Emphasizes period since World War I. Consideration of changing patterns of investment, consumption and employment. Pre: 150, 151.

414 Economic Development of Japan (3) II**Oshima**

Study of history and economic development of Japan from Meiji period to present; factors which contributed to take-off; structural changes since World War II. Pre: 150-151 or consent of instructor.

415 Asian Economic Development (3) I**Naya**

Study of history and economic development of Asian nations other than Japan. Resources, population and income; savings, investment and consumption patterns. Role of government and private enterprise. Pre: 150-151 or consent of instructor.

420 Mathematical Economics (3) II**Ashby, Tawil**

Review and application of mathematical techniques in economic analysis: differentiation, integration, differential equations, difference equations and linear programming. Pre: 300, 301, and Math 205 (calculus).

425 Econometrics I (3) I**Chau, Tawil**

Review of matrix algebra; examination of bi-variate and multivariate regression analysis, correlation theory, properties of least squares and maximum likelihood estimates under different assumptions; examination of estimation problems likely to be encountered. Pre: 321.

426 Econometrics II (3) II**Tawil**

Reviews of matrix algebra, multiple regression and problems of statistical estimation including the identification problem. Exploration of methods of simultaneous equation estimation such as indirect least squares, two-stage least squares, limited information maximum likelihood, three-stage least squares, and full information maximum likelihood. Pre: 424.

ECONOMICS

- 430 Economics of Human Resources (3) I** **Haines, Hight**
Economic analysis applied to the labor market with particular emphasis on investment in human capital, economics of education, health, migration, etc. Pre: 301.
- 440 Monetary Theory and Policy (3) I** **Lefton**
Critical analysis of monetary theory and policy with special emphasis devoted to quantity theory, national income theory, and tools of central banking and debt management. Pre: 300, 340.
- 450 Public Finance (3) I** **Ebel, Pollock**
Considers governmental expenditures, revenues and debt, both descriptively and theoretically. Fiscal policy considered, as are budgeting and tax administration. Pre: 300, 301.
- 452 State and Local Finance (3) II** **Ebel, Pollock**
Intensive study of fiscal institutions, operations, and policy questions within state and local governments in U.S. Consideration of grant programs and other links with central government. Pre: 150-151 or consent of instructor.
- 460 International Trade Theory (3) I** **Naya, Yeh**
Theoretical, institutional and historical aspects of international economic relations considered, including foreign exchange rates, balance of payments adjustment, tariffs, quotas, trading blocks. Pre: 300, 301.
- 461 International Finance (3) II** **Comitini, Yeh**
Institutional and theoretical aspects of international financing: balance of payments, exchange rates, capital movements, and multilateral equilibrium in world money market. Pre: 300, 460.
- 470 Industrial Organization and Public Control of Business (3) I** **Hight, Miklius**
Organization and structure of American industries and markets. Competitive behavior, pricing policies, market performance. Social control of business through antitrust and other government regulation. Pre: 300, 301.
- 480 Transportation and Public Utilities (3) II** **Miklius**
Economic characteristics of transportation and public utility industries. Analysis of objectives, problems and effects of government regulation of these industries. Pre: 300, 301.
- 490 Location Theory and Regional Analysis (3) I**
Location theories concerned with agricultural, manufacturing and tertiary activities and with urban systems. Basic methods of locational analysis. Paths towards application in regional economic planning. Identical to Geog 420. Pre: 150-151.
- 492 Regional Economic Development (3) II**
Sources of regional economic growth and of regional development planning. Emphasis on Hawaiian economy and experience. Pre: 300-301 or consent of instructor.
- 496 Selected Topics in Contemporary Economic Problems (3) II**
Problem areas of contemporary interest, such as welfare economics, economics of foreign aid, economic integration, crisis in international payment mechanism, topics in state and local finance, non-economic aspects of economic development, economic implications of political changes, etc. Selection of topics to depend on instructor. Pre: 120 or consent of instructor.
- 600 Macroeconomic Theory (3) I** **Ashby, Campbell**
Keynesian and post-Keynesian theories of aggregative economics with special attention to factors determining levels of employment, prices, real income. Stabilization policies. Pre: 300.
- 601 Microeconomic Theory (3) I** **Coffman, Hung**
Rigorous analysis of consumer's choice, pricing of products and factors of production under competitive conditions, partial and general equilibrium, monopoly and imperfect competition, risk and uncertainty, and capital theory. Pre: 301.
- 602 Economic Growth and Fluctuations (3) II** **Campbell**
Aggregate dynamic models of growth and fluctuations: current literature including neo-classical and neo-Keynesian models of economic growth, dynamic Leontief models and activity analysis. Pre: 600.

603 Selected Topics in Microeconomic Theory (3) II**Hung**

Discussion of selected topics in microeconomic theory, e.g. economics of household; firm and industry; market structure; income distribution; welfare economics; linear programming; decision theory; organization theory. Pre: 601.

604 History of Economic Thought (3) I

Development of economic theories, including classical economics, marginal utility theory, socialism, neo-classical theory, welfare economics, Keynesian and post-Keynesian systems. Pre: 404, or consent of instructor.

606 National Income Accounts (3) II**Oshima**

Theory underlying construction of national economic accounts: methods of estimation of entries in accounts; uses of national accounting statistics. Pre: consent of instructor.

610 Economic Development I (3) I**Lim, Oshima**

Theoretical analysis of factors underlying economic development with reference to underdeveloped nations. Survey of theoretical literature on economic development, dealing with causes of underdevelopment and development, alternative development models and their policy implications. Pre: consent of instructor.

611 Economic Development II (3) II**Lim**

Design of policy measures to accelerate economic development in underdeveloped countries (e.g. investment criteria). Various techniques of development planning (including input-output analysis, linear programming and macroeconomic models) applied to problems of economic development. Pre: 610.

614 Economic Development of Japan (3) I**Oshima**

Analysis of growth from Meiji period to present. Problems of population change, capital formation, income distribution, industrial structure. Pre: 610 or consent of instructor.

616 Economic Development of China (3) II**Burcroff, Hung**

Analysis of development from Ch'ing period to present. Special focus on problems of industrialization, economic growth and structural change since 1949. Pre: 610 or consent of instructor.

618 Economic Development of Selected Asian Nations (3) I, II**Burcroff, Lim, Naya,****Oshima**

Development patterns of selected nations and differences in economic institutions considered. Policy measures, especially planning schema and their execution, reviewed. (Nations covered may include Korea, Taiwan, Philippines, Indonesia, other S.E. Asian countries, selection to depend on instructor.) Pre: 610.

621 Mathematical Economics (3) I**Ashby**

Application of mathematical methods to economic theory. Partial differentiation, integral calculus, series and expansion, vectors and matrices, determinants, systems of difference and differential equations, stability conditions, inter-industry relations, programming of activities and allocation of resources, aggregation problem, elementary theory of games. Pre: 420 or consent of instructor.

624 Econometrics I (3) I**Chau, Tawil**

Probability theory and statistical inference for time series analysis. Construction and testing of econometric models. Pre: 424 or consent of instructor.

626 Econometrics II (3) II**Chau**

Advanced topics in time series analysis. Simulation models; forecasting and development planning. Pre: 624.

627 Economic Programming (3) II**Chau**

Application of input-output analysis, linear programming, and macro-economic models to problems of economic development and planning. Pre: 420 or consent of instructor.

640 Monetary Theory (3) II**Ashby, Campbell**

Analysis of selected problems in monetary economics, with emphasis on monetary and banking policy. Pre: 440 or consent of instructor.

- 650 Theory of Public Finance (3) II** **Ebel, Kamins, Pollock**
 Considers role of public finance in national economy. Examines operation of fiscal devices available to policy makers. Pre: 450.
- 660 International Trade Theory (3) I** **Gorter, Naya, Yeh**
 Modern development in national income theory and welfare economics with relation to international trade. Pre: 460, or consent of instructor.
- 662 International Finance (3) I** **Comitini, Yeh**
 Balance of payments, exchange rates, capital transfers, international financial equilibrium. Pre: 461 or consent of instructor.
- 690 Regional Economic Analysis (3) I** **Mark**
 Selected problems of regional economic analysis and regional projections. Discussion of specific regional and interregional input-output models. Identical to Geog 620. Pre: 310 or 492 or equivalent.
- 699 Directed Research (arr.) I, II** **Staff**
 Pre: consent of department chairman.
- 710 Seminar in Economic Development (3) II** **Lim, Naya**
 Case studies, emphasizing research approaches and techniques. Theories of economic development applied to experience of certain Asian nations. Pre: 610 or consent of instructor.
- 745 Workshop: Financial and Monetary Aspects of Economic Development (arr.)** **Shaw**
 Role of monetary system and non-bank financial institutions in developing nations and in development planning considered. Research papers required. Pre: 610, 640, or consent of instructor.
- 760 Seminar in International Economics (3) II** **Gorter**
 Special studies in theories of international trade and international finance. Pre: 660, 662, or consent of instructor.

English (Eng)

Senior Professors DAY, WILSON; Professors ANDERSON, BOUSLOG, FUJIMURA, LOWERS, SHEN, STEMPER, SUMMERSGILL; Associate Professors BACKUS, CANARY, CRYMES, FRIEDSON, FRIERSON, HOLLINGSHEAD, HUNTSBERRY, LARSON, LEIB, LEVY, MALTBY, SCOTT, STILLIANS, WELLEN, WILEY, WINTERS; Assistant Professors CREED, EDELSTEIN, FELDMAN, FLYNN, FONG, FRIEDERICH, GLICK, GLISSMEYER, GRAY, GRIFFING, HEINE, KRAUSE, LESTER, MANEY, McCUTCHEON, MENIKOFF, RICHSTAD, SIMSON, SINCLAIR, SOLOMON, TAYLOR, TEEVAN, THOMPSON, TOPHAM, WILSON, WRIGHT; Instructors ABRAMSON, ABRUMS, ALEXANDER, BREEN, CARTER, DAMON, DeLUCA, DENHAM, DERRICK, DORN, DURANT, DYE, ECKLOR, EMBRY, FELLMETH, FRIEDMAN, HURN, KAMINS, KARNES, KENNEDY, KISER, KOWALSKI, LeDOUX, LEE, LIGHTY, LIVINGSTON, LYNCH, MacMILLAN, McCLEAR, McMANUS, MUNDY, NELSON, NEWTON, POTTER, RAYMOND, SCHLIEMAN, SCHWANKEKAMP, SIVERLY, SOHL, STEVICK, VAUGHN, VELLA, VON KREISLER; Assistant Professors KAU, WOODS

- 100 Expository Writing (3) I, II** **Larson, Staff**
 Study of principal steps in effective exposition—discovering, interpreting, and evaluating data through observation and reading; deciding upon an appropriate organizational plan; choosing a voice and style suitable to the writer's audience and the occasion for writing — accompanied by practice in the analysis of expository pieces by professional writers.

Students whose last names begin with A-M will register for 100 in the fall term; those from N-Z in the spring.

- 102 Expository Writing (3) I** **Larson, Staff**
 Offered for the last time Fall, 1969. Practice in writing argumentative papers and in writing interpretive papers about literary texts centering around a major theme. Required of students who have credit for 101, and open only to such students. Not open to students who have taken 100. All students who have taken 101 previously must take 102 in the fall to complete the freshman English requirement.

101 and 102, or 105, or 100 is prerequisite to all sophomore literature courses.

Any of the following six semester courses (251-256) satisfies the requirement for sophomore literature.

251-252 Major Works of British and American Literature (3-3) Yr. Stillians, Staff
251: Middle Ages to 1800. 252: 1800 to present.

253-254 World Literature (3-3) Yr. Sinclair, Staff
Major works of classical, Oriental, European, American literature. 253: Classical times to Renaissance. 254: 1600 to present.

255-256 Types of Literature (3-3) Yr. Huntsberry, Staff
Practical criticism in major genres of European and American literature. 255: short story, novel, introduction to poetry (narrative). 256: drama, biography, poetry.

Two semesters of sophomore literature (251, 252, 253, 254, 255, 256) are prerequisites for upper division courses beginning with English 312.

309 Written Communication (3) I, II Kennedy, Staff
Practice in informative, analytical, persuasive writing. Open only to students in business administration and home economics. Pre: 102 and sophomore literature, or equivalents.

310 Technical Exposition (3) I, II Leib, Staff
Analysis of selected scientific prose; principles and practice of presenting technical information. Open only to juniors and seniors in scientific fields.

312 Literary Writing (3) I, II Krause
Writing and criticism of essays, designed to develop effective expression, with emphasis on lively and individual style. Pre: consent of instructor.

313 Introduction to Imaginative Writing (3) I, II Huntsberry, MacMillan, Thompson
The basic principles of the writing arts explored through the composition of poems, short stories, and one-act plays.

315 Advanced Expository Writing (3) I, II Taylor, Staff
Writing of essays from logical and rhetorical principles, especially modes of definition, assertion, proof. Emphasis on clarity, coherence, style.

320 Introduction to Language (3) I, II Glissmeyer, Staff
Examination of modern concepts of structure and use of language, with special reference to English.

331 Introduction to Poetry (3) I, II Solomon, Staff
Written and oral analysis of imagery, sound, language, form and structure of poems, leading to increased awareness of nature of poetry.

335 Backgrounds of World Literature (3) I, II Backus
Most important sources of European literary themes and allusions, including King James Bible and western European myth and legend.

336 Introduction to Literary Problems (3) I, II Bouslog, Staff
Critical evaluation of the genres of literature, of various modes of analysis, of problems involved in literary perception.

337 Masters of Literary Criticism (3) I, II Staff
Survey of the chief writings in criticism from Aristotle through Arnold (in English), with emphasis on classical answers to critical problems.

351-352 English Literary History (3-3) Yr. Staff
Readings in representative authors and works, with emphasis on history of ideas and development of literary forms. 351: beginnings to 1798. 352: Romantics to present.

397-398 Junior Honors Program in English (3-3) Yr. Bouslog
Individual study of periods of English literature, from Anglo-Saxon times through 15th century. Tutorial methods. Consult departmental honors adviser.

401 Modern English Grammar (3) I, II Crymes, Flynn, Lester, Shen
Syntax of modern English examined within framework of recent linguistic scholarship.

ENGLISH

- 402 History of the English Language (3) I, II** Flynn, Lester, Wellein
Introduction to older stages of English and processes by which Modern English evolved.
- 404 English Phonology (3) I** Shen
Study of English sound system (including morphophonemics) and of recent theories of phonological interpretation. Pre: 320, 401, Ling 102, Sp 211 or equivalent.
- 411 Poetry Writing (3) II** Thompson
Writing and criticism of poetry. Pre: 331, consent of instructor.
- 413 Form and Theory in Writing Fiction (3) I, II** Huntsberry, Staff
Study of techniques of prose fiction from standpoint of the writer.
- 414 Narrative Writing (3) I, II** Huntsberry, Staff
Instruction and practice in writing short story. Pre: 413 or equivalent.
- 415 Advanced Narrative Writing (3) I, II** Huntsberry, Staff
Developing skill in story telling (either short story or novel). Pre: 414 or equivalent.
- 421 English Drama to 1642 (3) II** Fujimura, Lowers, Summersgill
Origins of English drama; medieval drama and theatre; contemporaries and successors of Shakespeare.
- 431, 432 The English Novel (3, 3) Yr.** Heine, Hollingshead
Historical and critical study of development of English novel. 431: during 18th and early 19th centuries, with emphasis on rise of realistic novel. 432: from Dickens to Hardy.
- 433 20th-Century British Novel (3) I, II** Staff
- 442 Chaucer (3) I, II** Summersgill, Wellein
Study of Chaucer's development from early poems through *The Canterbury Tales*.
- 445, 446 Shakespeare (3, 3) Yr.** Staff
Critical study of Shakespeare's plays. 445: from the beginning to *Hamlet*. 446: *Hamlet* through last plays. Both semester courses taught each semester.
- 447 Milton (3) I** Larson, McCutcheon
Selected poetry and prose.
- 451 Medieval English Literature (3) I** Leib, Taylor
Representative Old and Middle English poetry, prose, exclusive of Chaucer, with continental backgrounds; chiefly in translation.
- 453 16th-Century English Literature (3) I** Lowers, McCutcheon
Poetry and prose of Tudor period, exclusive of the drama.
- 454 Early 17th-Century English Literature (3) II** Fujimura, McCutcheon
Poetry and prose of 17th century to 1660, exclusive of the drama.
- 456 Restoration Literature (3) II** Anderson, Fujimura, Larson
Poetry, prose, drama from 1660 to 1700, exclusive of Milton.
- 457, 458 18th-Century English Literature (3, 3) Yr.** Anderson, Fong, Fujimura, Maltby
Poetry, prose (exclusive of the novel), drama. 457: from 1700 to 1740, with emphasis on Pope and Swift. 458: 1740 to 1780, with emphasis on Johnson and his circle.
- 461 The Romantic Movement in England (3) I** Fong, Stempel, Stillians
Poetry and prose from 1780 to 1832, exclusive of the novel.
- 463, 464 Victorian Literature (3, 3) Yr.** Frierson, Stempel
Poetry and prose exclusive of the novel. 463: from 1832-1870. 464: from 1870-1914.
- 469 Studies in British Literature (3) I, II** Staff
Some aspect of British literature, such as genre, one or more major authors, etc. May be repeated for credit.
- 471, 472 American Literature (3, 3) Yr.** Staff
Critical study of American literature. 471: from beginnings to Civil War. 472: from Civil War to present. Both semester courses taught each semester.
- 475, 476 The American Novel (3, 3) Yr.** Bouslog, Canary, Levy
Development of American novel. 475: beginnings to 1900. 476: 1900 to present.

- 479 Studies in American Literature (3) I, II** **Staff**
Some aspect of American literature, such as genre, one or more major authors, etc. May be repeated for credit.
- 480 Literature of the Pacific (3) II** **Backus, Leib, Stillians**
Pacific Islands, Australia: narratives of voyagers, translations of native literature, fiction by Melville, Stevenson. London, Becke, Nordhoff, Hall.
- 482 The Narratives of Oral Tradition (3) II** **Staff**
Examination of folk narratives (prose types of folktale, ballad and related types of poetry, and epic); their relation to art-literature. (Alt. yrs., not offered 1969-70.)
- 483, 484 Modern Dramatic Literature (3, 3) Yr.** **Friedson, Maltby, Teevan, Topham**
483: European, Ibsen, and Chekhov to Shaw, 1880-1920. 484: European and American, O'Casey to Miller, 1920 on.
- 487 20th-Century British and American Poetry (3) I, II** **Heine, Sinclair, Teevan**
- 497-498 Senior Honors Tutorial (6-6) Yr.** **Stillians, Staff**
Intensive study of periods of English and American literature. Tutorial methods. Consult departmental honors adviser.
- 610 Rhetoric: Theories and Applications (3) II** **Larson**
Major rhetorical theories from Aristotle to the present; uses of rhetorical perspectives in the analysis of non-fiction prose, the interpretation of imaginative literature, and in oral and written composing; current developments and issues in rhetorical theory.
- 630 Seminar in Research Methods (3) I, II** **Bouslog, Gray**
Kinds of research, problems of bibliography, fundamentals of thesis writing. Required of all candidates for M.A. degree in English.
- 637, 638 History of Literary Criticism (3, 3) Yr.** **Fujimura, Simson, Stempel**
Chief theories of literary criticism, with readings (in English). 637: from Plato to the late 19th century. 638: modern literary criticism.
- 640 Old English (3) I** **Lester, Wellein**
Structure of the language, relation to present English; reading of selected prose and poetry. Pre: consent of instructor. (Alt. yrs., not offered 1969-70.)
- 660 Major Authors (3) I, II** **Staff**
Study of one or more authors, English or American.
- 675 Literary Genres and Problems (3) I, II** **Staff**
Study of one area of English or American literature.
- 735 Seminar in Comparative Literature (3) II** **Staff**
Introduction to comparative literature; relationship of English to other literatures; sources and influences. Pre: consent of instructor.
- 745 Seminar in English Language (3) I, II** **Staff**
Intensive study of one topic in English linguistics. Pre: consent of instructor. May be repeated for credit.
- 757 Seminar in Shakespeare (3) II** **Staff**
Intensive study of Shakespeare. Pre: consent of instructor.
- 775 Seminar in English Literature (3) I, II** **Staff**
Study of authors or a period. Pre: consent of instructor.
- 780 Seminar in American Literature (3) I, II** **Staff**
Intensive study of one or two writers. Pre: consent of instructor.
- 785 Seminar in American Literature (3) I, II** **Staff**
Study of a problem or a period. Pre: consent of instructor.
- 790 Teaching Composition (3) I** **Larson**
Theory and observation of teaching of composition, principally at college level, but with some applications to composition in secondary school. Limited number of secondary school teachers of English admitted. Pre: consent of instructor.

- 791 Student Teaching of College Composition (3) II** **Larson**
Supervised experience in teaching composition at college level. Pre: 790 or equivalent.
- 799 Directed Research (arr.) I, II** **Staff**
Individual reading or research. Pre: consent of instructor.

Journalism (Journ)

- 111 Publications Workshop (1) I, II** **Richstad, Wiley**
Reporting, copy editing, advertising copywriting, proofreading, photography under supervision of publications executives and instructor.
- 150 The Press and Society (3) I, II** **Richstad**
Analysis and evaluation of American journalism as shaped by historical, legal, economic, social forces; comparison/contrast with the world press.
- 205 News Writing (3) I, II** **Wiley**
Fundamentals of news style, reporting, ethics. Pre: Eng 102.
- 206 News Editing (3) I, II** **Richstad**
News and photo editing, headline writing, publications makeup. Pre: 205.
- 207 Editors Workshop (2) I, II** **Staff**
Editorial problems. Pre: consent of instructor.
- 239 Mass Media (3) I** **Scott**
Mass communications as result of technological, industrial organization; characteristics of mass media and consumer response to media.
- 250 Typography (3) I** **Scott**
Basic printing procedures and design; history of typography.
- 315 Investigative Reporting (3) I, II** **Wiley**
Preparing specialized material for mass media, with emphasis on problems of objectivity, analysis, interpretation. Pre: consent of instructor.
- 316 Editing and Publishing (3) II** **Scott**
Illustration and typographical design; printing processes; newspaper and magazine management; editorial responsibility; laws of libel and copyright. Pre: 206.
- 325 Writing Non-Fiction (3) II** **Wiley**
Writing non-fiction articles for magazines and newspapers; preparing material for specific audience; marketing articles. Pre: consent of instructor.
- 385 Directed Work (3) I, II** **Scott, Wiley**
Internship in media operations under professional and faculty supervision. Pre: consent of instructor.

English as a Second Language (ESL)

Associate Professor PLAISTER; Assistant Professors ALTER, ARAPOFF, BLATCHFORD, COLLIER, K. JACKSON, MASON, SCHAAFSMA, WILSON; Instructors BARHAM, CRAMER, CURRIER, DAY, HARRINGTON, J. JACKSON, JAMES, JOHNSON, RICKARD; Associate Professor LESTER

English Language Institute (ELI)

Note: Initial placement in ELI courses is by examination only. A grade of P (Pass) is prerequisite to subsequent promotion or exemption. See "Special Instructional Programs" for further discussion of assignment to and exemption from ELI courses. Normal course sequencing and progression is as follows: 60, 70, 80; 61, 71, 181; 62, 72; 63, 73, 183.

60 Oral English for Foreign Students (0) I, II

Intensive drill to develop facility in speaking and understanding. Language laboratory work also required. Equals 4 credits.

61 English Structure for Foreign Students (0) I, II

Intensive drill on recognition and production of English grammatical signals. Equals 2 credits.

62 Reading Program for Foreign Students (0) I, II

Instruction and practice in developing improved reading comprehension and speed, and in effective use of textbooks and reference materials. Equals 3 credits.

63 Writing Program for Foreign Students (0) I, II

Instruction and practice in factual reporting and summarizing; effect of grammatical devices on meaning and organization. Equals 3 credits.

70 Intermediate Oral English for Foreign Students (0) I, II

Further practice in spoken fluency and accurate aural comprehension. Language laboratory work required. Equals 3 credits.

71 Intermediate English Structure for Foreign Students (0) I, II

Further drill on English grammatical patterns. Equals 1 credit.

72 Intermediate Reading Program for Foreign Students (0) I, II

Further work on reading comprehension and speed, techniques of skimming and rapid review. Equals 2 credits.

73 Intermediate Writing Program for Foreign Students (0) I, II

Instruction and practice in essay-type writing; gathering, classification, organization of facts. Equals 2 credits.

80 Advanced Oral English for Foreign Students (0) I, II

Emphasis on comprehension of unmodified streams of speech and extended oral discourse. Equals 1 credit.

181 Advanced English Structure for Foreign Students (1) I, II

Emphasis on control of complex spoken and written syntactical constructions.

183 Advanced Writing Program for Foreign Students (2) I, II

Writing of critical reports and term papers; logical analysis and evaluation of facts.

English as a Second Language (ESL)

610 Teaching English as a Second Language (3) II

Analysis of methods of teaching English as second language. Attention to implications for language teaching of recent and current research in language and language learning. Pre: Ling 320. For non-majors, consent of department chairman.

710 Materials Development for TESL (3) I

Principles of planning and writing drill and text materials for English as second language. Survey and analysis of existing materials. Pre: 610.

720 Second Language Testing (3) I, II

Measurement and evaluation of achievement and proficiency in second language learning. Pre: 610 or consent of instructor.

730 Seminar in Applied Linguistics (3) I

Application of linguistics to second language teaching. Readings and discussion of current issues in applied linguistics. Pre: consent of instructor.

799 Directed Research (arr.) I, II

Individual reading or research in various aspects of teaching English as second language. Pre: consent of department chairman and instructor.

European Languages

Professors ASPINWALL, DAUER, KNOWLTON, SEYMOUR; Visiting Professor LUSSEYRAN; Associate Professors S. BACIU, BURNS, HADLICH, HOLTON, JACKSON, KLIMENKO, M. MONTES, NIEDZIELSKI; Assistant Professors M. BACIU, BREININGER, ELLIOTT, EU'CHER, FROHLICH, HEIEN, LEROND, S. MILLER, Y. MONTES, MOORE, SCHERER, TYLER, WINTER, WOOD; Instructors CARSTANJEN, CANNADAY, GRAY, GREENE, HULL, ISHMAEL, LEPLY, OWENS, PASSLER, RODRIGUEZ, STUEBE

General (EL)

199 Directed Language Study (arr.) I, II

Directed study in European languages not taught on regular basis (e.g., Danish, Rumanian, etc.), depending on demand and staff. Pre: permission of department chairman.

381 The Modern German Poet (3) II

Scherer

Perspective of reality and poetic representations in the 20th century world, including influences from the Orient and Eastern philosophy. No knowledge of German required. No credit toward German major. Open to lower division students.

399 Directed Reading (arr.) I, II

Individual projects in various fields. Limited to senior majors with 2.7 grade-point ratio, or 3.0 grade-point in the department major. Pre: permission of department chairman.

610 Contrastive Analysis of Spanish and French with English (3) I or II

Structures of Spanish and French contrasted with English on phonemic, morphological, and syntactic levels. Elucidation of nature and cause of learning problems of French or Spanish students. Pre: Span 431 or Fr 306. Eng 320 or 401 recommended.

621 Comparative Romance Linguistics (3) I

Comparative study of linguistic development of Romance Languages from Latin. Pre: Ling 320 or the equivalent. Reading knowledge of at least one Romance language and of Latin recommended. (Alt. yrs.)

630 Seminar in Research Methods (1) I

(1) French, (2) Spanish, (3) German. Study of available source material from the Middle Ages to the 20th century, with emphasis upon basic research tools and methods.

LITERATURE IN TRANSLATION

These courses, given in English, are described in the offerings of the several language divisions below.

EL 381 The Modern German Poet (3) II

French 401 Literature Since 1800 in Translation (2) II

Greek 403 Greek Literature (3) I

Latin 404 Roman Literature (3) II

Russian 400 Contemporary Literature in Translation (3) II

Russian 402 19th-Century Novel in Translation (3) II

Spanish 456 Latin American Literature in Translation (3) II

Dutch (Du)

311-312 Reading, Comprehension, and Speaking Skills (3-3) Yr.

Wood

Introduction to modern Dutch designed for students who wish to study a second foreign language. Reading, grammar, with some conversation and laboratory drill. Cannot be used to fulfill a language requirement.

French (Fr)

Note: All courses except 401 are conducted in French.

- 101-102 Elementary French (4-4) Yr.**
Conversation, laboratory drill, grammar, reading.
- 103 Intensive Elementary French (8) I, II**
Class meets 2 hours daily, Monday through Friday. In one semester the contents of French 101-102 will be presented.
- 201-202 Intermediate French (3-3) Yr.**
Reading, conversation, laboratory drill, composition. Pre: 102 or the equivalent.
- 210 Accelerated Intermediate French (6) I, II**
Course contents of 201-202 covered in one semester. Class meets daily for one hour. Monday through Saturday, with daily laboratory practice. Pre: 102 or equivalent.
- 301 Phonetics and Pronunciation Practice (3) I, II** **Lerond, Niedzielski**
Analysis of French phonological system. Practice and laboratory drill designed to improve the student's pronunciation. Pre: 101 or two years of high school French.
- 306 Structure of French (3) II** **Niedzielski**
Study of structure of contemporary French as analyzed by descriptive linguists. Pre: 202 or equivalent.
- 311 Advanced Conversation (3) I, II**
Systematic practice designed to develop student's control of spoken French. Attention to further development of vocabulary which will permit accurate and mature expression on variety of topics. Pre: 202 or equivalent.
- 312 Advanced Composition (3) I, II**
Emphasis on strengthening facility with language through further training in syntax structure and composition writing. Pre: 202.
- 331-332 Survey of French Literature (3-3)** **Gray, Jackson**
Survey of French literature covering major authors and movements. Pre: 311-312 with which either 331 or 332 may be taken concurrently.
- 361 French Civilization (3) I** **Gray**
Survey of culture and institutions of modern France. Pre: 202. May be taken concurrently with 311 or 312.
- 401 Literature since 1800 in Translation (2) I or II** **Aspinwall, Jackson**
Rapid reading in translation; lectures, discussion, and reports. Pre: two semesters of literature courses in English department. (Alternates with Rus 402.) Not creditable toward the major.
- 407 Introduction to Medieval Language and Civilization (3) I** **Niedzielski**
Introduction to medieval language through contrastive analysis with modern French. Selected readings on medieval history and civilization. Pre: either 311-312 or 306.
- 408 Masterpieces of Medieval Literature (3) II** **Eucler, Niedzielski**
Samplings taken from each genre: epic, novel, verse and prose tale, lyric poetry, chronicle, theatre, didactic literature. Elementary readings in original text with edition giving modern French translations. Pre: 407 or equivalent.
- 410 Masterpieces of 16th-Century Literature (3) II** **Eucler**
Samplings taken from all major writers of the period. Readings in original text with edition giving modern French equivalents for difficult words. Pre: 331 or 332.
- 411-412 Masterpieces of 17th-Century Literature (3-3) Yr.** **Gray**
1st sem.: Drama. Study of the principal works of major dramatists of the 17th century: Corneille, Molière, Racine. *2nd sem.:* Non-dramatic literature. Study of the principal movements and major authors of non-dramatic prose and poetry of the 17th century. Pre: 331 or 332.
- 413 Masterpieces of 18th-Century Literature (3) II** **Eucler, Jackson, Lusseyran**
Pre: 331 or 332.

- 415–416 Masterpieces of 19th-Century Literature (2–2)** **Aspinwall, Jackson**
 415: Poetry; 416: Prose. Pre: 331 or 332.
- 420 20th-Century French Novel (3) I or II**
 Study of major French novelists of 20th century and their works. Gide, Proust, Mauriac, Sartre, Camus, etc. Pre: 331–332.
- 421 20th-Century French Theatre (3) I or II** **Lusseyran**
 Study of major French playwrights of 20th century and their works. Claudel, Giraudoux, Anouilh, Sartre, Camus, etc. Pre: 331–332.
- 422 20th-Century French Poetry (3) I or II** **Aspinwall**
 Explication and discussion of poems by such poets as Valéry, Claudel, Apollinaire, Supervielle, Saint-John Perse, Breton, Desnos, Eluard, Aragon, Char, Reverdy. The goal is appreciation. Desirable preparation: 331–332.
- 491 Seminar in French Literature (3) I**
 Study of authors or a period. Pre: senior standing, honors, or permission of Division chairman.
- 601 Seminar in Contemporary French Literature (3) I or II** **Aspinwall**
 Study of authors and movements of modern period.
- 602 Seminar in French Poetry (3) I or II** **Aspinwall**
 Technical study of representative poems from Renaissance to present.
- 609 French Renaissance (3) I or II**
 Poetry, theatre, prose. Emphasis on Montaigne and Rabelais. Lectures, discussions, reports.
- 610 Masterpieces of the Baroque Age (3) II**
- 651 Philosophic Currents in the 18th Century (3) I or II** **Lusseyran**
 Study of philosophic movements and their impact on the social, political and literary life of the period and the modern era.
- 661 Stylistics (3) I** **Lerond**
 Designed to give mastery of structure and phrasing. Translation into French, discussion, composition.
- 666 Seminar in History of French Literary Criticism (2) I or II** **Jackson**
 Study of important literary criticism in France from Renaissance to present and its influence upon French literary history.
- 671 History of the Language (3) I** **Niedzielski**
 Introduction to historical development of the French nation, its civilization and its language. Contrastive analysis. Readings of selected texts.
- 672 Medieval Literature (2) II** **Niedzielski**
 Early Medieval literature: Genesis and evolution of literary genres in Old French.
- 681 The Novel in France (3) I or II** **Jackson**
 Historical development of genre and study of major novels which have influenced movements or established techniques. Pre: 5 credits at 400 level or equivalent. (Alternates with 690.)
- 685 Seminar in Realism in French Literature (3) I or II** **Jackson**
 Study of the major authors and works relevant to the development of the realistic school in the novel and the theatre.
- 690 The Theatre in France (3) I or II** **Lusseyran**
 Historical development of genre and study of major dramatists who have influenced movements or established techniques. Pre: 5 credits at 400 level or equivalent.
- 699 Directed Research (arr.) I, II**
 Pre: consent of chairman.
- 735 Seminar in French Literature (3) I or II**
 Study of authors or a period Pre: consent of chairman of graduate field.
- 800 Thesis Research (6)**

German (Ger)

Note: All courses are conducted in German.

101-102 Elementary German (4-4) Yr.

Conversation, laboratory drill, grammar, reading.

201-202 Intermediate German (3-3) Yr.

Reading, conversation, laboratory drill, composition. Pre: 102 or equivalent.

203 German Phonetics (3) I, II

Seymour, Wood

Exercises in German pronunciation, reading, speaking; laboratory exercises. Pre: 102. May be taken concurrently with 201 or 202.

212 Intermediate: Science German (3) II

Accurate reading over wide range of subjects. Emphasis on sentence structure and vocabulary building. Pre: 201. B.S. candidates only or permission of dept. chairman.

305-306 Composition and Conversation (3-3) Yr.

Frohlich, Moore, Passler

Designed to develop proficiency in German sentence structure and phrasing; conversation; laboratory drill; exact composition on literary subjects. Pre: 202. Pre: for 306: 305.

311-312 Introduction to German Literature (3-3) Yr.

Frohlich, Scherer

Representative reading and discussion of cultural periods in chronological order; laboratory exercises. Pre: 306. For majors, concurrent registration with 305-306 is permitted.

315 Structure of the German Language (3) I

Seymour, Wood

Phonological, morphological, syntactic structure of contemporary German, as analyzed by descriptive linguists. Pre: German 202.

318 The 19th-Century (3) II

Frohlich

Short prose form of the 19th century as a basis for techniques in literary analysis. Pre: 202; 315 recommended.

409 Enlightenment—Sturm Und Drang (3) I or II

Pre: 306 or equivalent; 318 recommended.

410 Classicism (3) I or II

Classical writings of Goethe and Schiller with some reference to other writers. Pre: 306 or equivalent; 318 recommended.

411 Romanticism (3) I or II

Pre: 306 or equivalent; 318 recommended.

413-414 German Literature From 1880 to the Present (3-3) Yr.

Frohlich, Scherer

413: Origins of German Naturalism and transition into Neo-Romanticism as exemplified in works of Gerhart Hauptmann and others. Pre: 306 or equivalent; 318 recommended. 414: Survey of simultaneous currents in German literature since 1918, with emphasis on lasting trends. Pre: 413 or equivalent.

432 Stylistics (3) I or II

Moore

Analysis of prose selections through identification of their structural and semantic elements. Written and oral styles with attention to specific structural elements and their semantic effect. Pre: 306 and 315.

451 Introduction to History of German Language (3) I

Seymour

Survey of important developments of the German language from the earliest beginnings to the present. Pre: 315.

452 Introduction to Middle High German (3) II

Seymour

Introduction to the phonology and morphology of Middle High German with selected readings. Pre: 315.

609-610 Middle High German (3-3) Yr.

Seymour, Wood

1st sem: Study of grammar, syntax, phonetics, rhythm, meter (alliteration), reading. *2nd sem:* Middle High German literature. Reading of Nibelungenlied, Parzifal, Minnesang and other poetry and prosework of the Middle Ages.

- 615 History of the German Language (3) I** Seymour
Fundamentals of linguistics; development of the language from Middle High German to the present.
- 616 History of the German Language (3) II** Seymour
Development of the language from the beginnings through the Old High German period. Pre: 615.
- 651 Seminar: The German Novelle (3) I** Dauer
Discussion of representative works of this genre from end of 18th century up to 1955.
- 652 Seminar: German Drama (3) II** Dauer
Development of dramatic theory and literature exemplified by typical works of literary periods.
- 653 Seminar: Lyric Poetry (3) I, II** Scherer
Interpretation and comparative study of works of representative German poets.
- 654 Seminar: The German Novel (3) I**
Reading and discussion of novels representative of a period, movement, or author.
- 655 Faust I (3) I**
Short history of Faust theme; Goethe's image of the "small world" or lower plane of human striving. (Alt. yrs.)
- 656 Faust II (3) II**
Symbolic "greater world" or higher plane of human aspiration. (Alt. yrs.)
- 699 Directed Research (arr.) I, II** Dauer, Seymour
Pre: consent of chairman.
- 735 Seminar in German Literature (9) I**
Study of authors, a genre, or a period. Pre: consent of chairman of graduate field.
- 800 Thesis Research, (6)** Seymour

Greek (Greek)

- 101-102 Elementary Greek (3-3) Yr.**
Introduction to literary Greek, with readings.
- 201-202 Intermediate Greek (3-3) Yr.**
Selected readings in Greek literature; introduction to Christian origins, readings in New Testament. Pre: 102 or the equivalent.
- 403 Greek Literature (3) I**
Major writers of Greece in translation. Pre: two semesters of literature courses. Does not count towards Classics major.
- 409 Plato (3) I or II**
Selections from the *Apology*, *Crito*, *Phaedo*. Pre: 202 or permission. (Alt. yrs.)
- 410 Historians (3) I or II** Tyler
Selections from Herodotus, Thucydides. Pre: 202. (Alt. yrs.)
- 421 Homer (3) I or II** Winter
Selections from *Iliad* and *Odyssey*. Pre: 202 or permission.
- 422 Lyric Poetry (3) I or II** Winter
Selections from lyric poets. Pre: 202 or permission. (Alt. yrs.)
- 431 Introduction to Drama (3) I** Burns
Selected readings in Greek dramatists. Pre: 202 or permission. (Alt. yrs.)
- 432 Drama (3) II** Burns
Reading of entire dramas by Aeschylus, Sophocles, Euripides. Pre: 431 or 421 or permission. (Alt. yrs.)
- 441 Pre-Socratics (3) I or II** Burns
Study of the fragments from the early Greek philosophers. (Alt. yrs.) Pre: permission.

- 442 Aristotle (3) I or II** **Tyler**
 Selected readings in Aristotle. (Alt. yrs.) Pre: permission.
- 490 Seminar (3) I, II** **Burns**
 Investigation in depth of a specific author or phase in field of Hellenic studies with individual research by participants. Pre: permission. May be repeated for credit.

Italian (It)

- 311-312 Comprehension, Speaking and Reading Skills (3-3) Yr.**
 Introduction to modern Italian designed for students who wish to study a second foreign language. Reading, grammar, conversation, laboratory drill. Cannot be used to fulfill a language requirement. Pre: equivalent of Latin, Spanish, French or Portuguese at the 102 level.
- 361-362 Intermediate Italian (3-3) Yr.**
 Continuation of 311-312. Reading, conversation, grammar, laboratory practice. Cannot be used to fulfill a language requirement. Pre: 312 or equivalent.

Latin (Latin)

- 101-102 Elementary Latin (3-3) Yr.**
 Vocabulary and grammar, with reading of simple Latin.
- 201-202 Intermediate Latin (3-3) Yr.**
 Review of grammar, reading of selections from prose and poetry. Pre: 102 or the equivalent.
- 301-302 Structure of Latin (3-3) Yr.**
 Intensive study of structural idiomatic and stylistic aspects of Latin. Pre: 202 or permission.
- 401 Historians (3) I or II** **Greene**
 Reading of Livy, Sallust, Tacitus and other Roman historians. (Alt. yrs.) Pre: 202 or permission.
- 404 Roman Literature (3) II**
 Major writers of Rome in translation. Pre: two semesters of literature courses. Does not count towards Classics major.
- 409 Lyric Poets (3) I or II** **Tyler**
 Selections from foremost Latin lyricists, Horace, Catullus, Propertius, Tibullus. Pre: 202 or permission. (Alternates with 401.)
- 420 Vergil (3) I or II** **Winter**
 Pre: 202 or permission. (Alt. yrs.)
- 427 Satire (3) I or II** **Greene**
 Selections from Horace, Juvenal, Martial. Pre: 202 or permission. (Alt. yrs.)
- 428 Drama (3) I or II** **Greene**
 Selected dramas of Plautus and Terence. Pre: 202 or permission. (Alternates with 427.)
- 433 Roman Philosophy (3) I or II** **Burns, Greene**
 Pre: permission. (Alt. yrs.)
- 434 Lucretius (3) I or II** **Winter**
De Rerum Natura. Pre: permission. (Alt. yrs.)
- 440 Oratory (3) I or II** **Greene**
 Pre: permission. (Alt. yrs.)
- 490 Seminar (3) I, II** **Tyler**
 Investigation in depth of a specific author or phase in field of Latin studies with individual research by participants. Pre: permission. May be repeated for credit.

Portuguese (Port)

- 101-102 Elementary Portuguese (4-4) Yr.** **S. Baciú**
Reading, conversation, laboratory drill, grammar.
- 201-202 Intermediate Portuguese (3-3) Yr.** **Ishmael**
Reading, conversation, writing, laboratory drill. Pre: 102 or the equivalent.
- 360-361 Introduction to Luso-Brazilian Literature (3-3)** **S. Baciú**
Brief period of intensive practice in reading Portuguese for students with knowledge of Spanish, followed by discussion and analysis of principal works of Portuguese and Brazilian literature. Pre: 202 or Spanish 304.

Russian (Rus)

For information on the Russian Area Studies Certificate see p. 64.

Note: All courses conducted in Russian except 400, 402 and 431-432.

- 101-102 Elementary Russian (4-4) Yr.** **Heien, Hull**
Conversation, lab drill, reading, writing, grammar.
- 201-202 Intermediate Russian (3-3) Yr.** **Heien**
Reading, conversation, laboratory drill, grammar, composition. Pre: 102 or equivalent.
- 207-208 Intermediate Scientific Russian (3-3) Yr.** **Breiningner**
Rapid reading of scientific material. Translation and grammar review. May be taken by majors for credit concurrently with 201-202, but not instead of it. May not be counted toward major. Recommended to students completing language requirement and to graduates. Pre: 102.
- 209 Russian Phonetics (3) I** **Breiningner**
Analysis of the Russian phonological system along with practice in speaking and reading to improve the student's oral proficiency. Pre: 102 or equivalent. May be taken concurrently with 201.
- 303-304 Advanced Oral Practice (3-3) Yr.** **Hull**
Systematic practice designed to develop students' control of spoken Russian through vocabulary building and stress on fluency of expression in a variety of subjects reinforced with laboratory drill. Pre: 202 or equivalent.
- 306 Structure and Composition (3) II** **Breiningner**
Advanced intensive studying of morphological and syntactic structure of contemporary Russian as analyzed by descriptive linguists along with composition and conversation. Pre: 202 or equivalent. 209 strongly recommended.
- 311-312 Introduction to Russian Literature and Civilization (3-3) Yr.** **Hull**
Survey; Russian literature covering major authors and discussion of historical background in order to provide insight into Russian culture. Pre: 304 or 306.
- 400 Contemporary Literature in Translation (3) II** **Breiningner, Klimentko**
Reading and discussion of short stories, plays, and poetry by Pasternak, Evtushenko, Solzhenitsyn and others. Not creditable toward major. Pre: consent of instructor. (Alt. yrs.)
- 402 19th-Century Novel in Translation (3) II** **Heien, Klimentko**
Survey of important novelists in translation, particularly Gogol, Goncharov, Turgenev, Saltykov, Dostoevsky, Tolstoi. Not creditable toward major. Pre: consent of instructor. (Alt. yrs.)
- 404 Literature of the 18th Century (3) II** **Breiningner, Klimentko**
Representative reading and discussion of more important writers before Pushkin. Pre: 306 or consent of instructor. (Alternates with 420; offered 1970-71.)
- 411-412 Literature of the 19th Century (3-3) Yr.** **Heien**
Reading and discussion of representative writers beginning with Pushkin. Pre: 306 or consent of instructor. (Alternates with 413-414.)

- 413-414 Literature of the 20th Century (3-3) Yr.** **Heien, Klimenko**
Representative writers before the revolution and contemporary Soviet writers. Pre: 306 or consent of instructor. (Alternates with 411-412.)
- 415 Russian Poetry (3) II** **Klimenko**
Reading and discussion of classical and contemporary Russian poets. Pre: 306 or consent of instructor. (Alternates with 417.)
- 417 Russian Drama (3) I** **Klimenko**
Representative plays of 18th, 19th, and 20th centuries. Pre: 306 or consent of instructor. (Alternates with 415.)
- 418 Advanced Composition and Stylistics (3) I** **Hull, Klimenko**
Study and analysis of representative prose selections which exhibit variations in style. Practice in written composition. Translation into Russian. Pre: 306 or consent of instructor.
- 420 History of Russian Language and Early Russian Literature (2) II** **Breining**
Study of development of Russian language. Representative readings in Russian literature through 17th century. Pre: 306 or consent of instructor. (Alternates with 404.)
- 431-432 Contemporary Soviet Russia (3-3) Yr.** **Klimenko**
Reading and discussion of contemporary Soviet prose, poetry and plays in English translation. Pre: consent of instructor.
- 495 Seminar in Russian Literature (3) I, II** **Klimenko**
Important literary movements and writers. Pre: consent of instructor.
- 699 Directed Reading (arr.) I, II** **Klimenko**
Pre: consent of instructor.

Spanish (Span)

Note: All courses conducted in Spanish except 106, 405 and 456.

- 101-102 Elementary Spanish (4-4) Yr.**
Beginning course, primarily emphasizing oral practice. Laboratory drill.
- 106 Spanish Translation for Non-Majors (0) I**
Practice in reading and translation of varied material, according to student's interests. Pre: 102 or consent of instructor.
- 110 Accelerated Elementary Spanish (8) I & II**
Meets 2 hours daily, Monday through Friday, with daily laboratory drill. In one semester, work of 101-102 covered.
- 201-202 Intermediate Spanish (3-3) Yr.**
Continuation of oral practice; with increasing emphasis on reading and written composition. Laboratory drill. Pre: 102 or equivalent.
- 210 Accelerated Intermediate Spanish (6) I & II**
Meets 1 hour daily, Monday through Saturday, with daily laboratory drill. In one semester, work of 201-202 covered.
- 303-304 Advanced Grammar and Composition (3-3) Yr.**
More detailed study of problem areas of Spanish grammar. Cultivation of accuracy and elegance in written expression. Pre: 202 or equivalent.
- 330 Phonetics and Pronunciation Practice (2) I, II** **Holton**
Analysis of Spanish phonological system, in contrast with English. Practice designed to perfect student's own pronunciation; laboratory drill. Pre: 202 or equivalent.
- 351-352 Spanish and Spanish-American Civilization (3-3) Yr.** **S. Baciú, M. Montes**
Survey of culture and institutions of modern Spain and Spanish America, with some attention to their historical backgrounds. Pre: 202 or equivalent.
- 365-366 Masterworks of Spanish and Spanish American Literature (4-4) Yr.**
Reading and discussion in Spanish of most important works of literature of Spain and Spanish America, from beginning to present. Pre: 202 or equivalent.

- 403-404 Advanced Oral Practice (3-3) Yr.** **Y. Montes**
Systematic practice designed to continue on advanced level student's control of spoken Spanish. Attention to further development of vocabulary which will permit accurate and mature expression on variety of topics. Laboratory drill. Pre: 304 or consent of instructor.
- 405 Spanish-English Translation (3) I** **Holton**
Study of factors involved in art of translation. Practice in translating literary and other material from Spanish to English and the reverse. Pre: 304 or consent of instructor.
- 431 The Structure of Spanish (3) I or II** **Hadlich**
Phonological, morphological, and syntactic structure of contemporary Spanish, as analyzed by descriptive linguists. Pre: Ling 102 or equivalent and Span 202 or consent of instructor.
- 441 History of the Spanish Language (3) I** **Knowlton**
Pre: Spanish 202 or equivalent; one semester of college Latin or equivalent.
- 444 Spanish Dialectology (3) II** **Hadlich, Holton, Knowlton**
Study of principal regional and social variants from cultured standard Castilian to be encountered in language of Iberian Peninsula, America, Philippines. Pre: 431 or consent of instructor.
- 456 Latin American Literature in Translation (3) II**
Reading and discussion of classic works of Latin American literature in translation. Purpose of the course is to provide insight into Latin American culture through its literature. Pre: 2 semesters of literature of a European language or English 251-252, or one semester of each.
- 465-466 Modern and Contemporary Spanish Literature (3-3) Yr.** **M. Montes, Y. Montes**
Reading and discussion of modern and 20th century peninsular authors. Studies of recent trends. Pre: 365 or consent of instructor.
- 470 Social & Political Ideas of 20th Century Latin America (3) II** **S. Baciú**
National and international significance of principal currents of Latin American thought as expressed in fundamental works of national authors. Pre: 351-352 or the equivalent.
- 485-486 Spanish-American Prose (3-3) Yr.**
Reading and discussion of important plays, short stories, novels and essays.
- 490 Hispano-Philippine Literature (2) II** **Knowlton**
Study of important writers in Spanish from the Philippine Islands. (Alt. yrs.; offered 1969-70.) Pre: 202 or equivalent.
- 625-626 Stylistics and Advanced Composition (3-3) Yr.** **M. Montes**
Study and analysis of representative prose selections which exhibit variations in style: colloquial, informal, formal expository, poetic, epistolary and the like. Practice in written composition in various styles analyzed.
- 658 Seminar in Spanish Linguistics (3) II** **Hadlich, Knowlton**
Study of a problem or problems in Spanish linguistics. Pre: consent of instructor. (May be repeated.)
- 665 Spanish Literature Prior to the Golden Age (3) I** **Knowlton, Y. Montes**
Major works and trends of periods prior to Golden Age. The epic, poetry, and prose. (Alt. yrs.; offered 1970-71.)
- 670 Spanish Literature of the Golden Age (3) II** **Y. Montes**
Representative readings in poetry, drama and prose of the 16th and 17th centuries. (Alt. yrs.; offered 1970-71.)
- 674 Spanish-American Lyric Poetry (3) II** **S. Baciú**
- 681-682 Spanish-American Novel (3-3) Yr.**
Development of the novel in Spanish America with emphasis on the 20th century. Pre: consent of instructor.

- 697 Seminar in Hispanic Literature (3) I, II S. Baciu, M. Montes, Y. Montes
Study of a period, author, genre or region. Pre: consent of instructor. (May be repeated.)
- 699 Directed Research (arr.) I, II
Pre: consent of chairman.
- 800 Thesis Research

General Science (Sci)

Professors BERNATOWICZ, KAY; Assistant Professors NEWHOUSE, SWEETERS; Instructors CHRISTOFFERSON, KLIM

- 121-122 Introduction to Science
(4-4) Yr. (3 L, 1 Lb) Bernatowicz, Newhouse, Sweets
Characteristics of science and interaction of society with science, illustrated by topics from biological science (121) and physical science (122).
- 420 Case Histories in Science (3) II (2L-Lb) Sweets
Emphasis on relations between facts, laws and theories, on innovations in methods and attitudes, on historical importance. Pre: 2 semesters of biological science, 2 semesters of physical science.
- 430 History of Science (3) I Bernatowicz
Man's changing ideas concerning the universe reflected against historical setting. Pre: one year of natural science. Cross-listed with History 430.
- 551-552 Seminar in Science for Secondary School Teachers (3-3) Yr. Townsley
Selected topics in botany, entomology, geochemistry, geology, mathematics, meteorology, microbiology, physics, zoology, and philosophy of science. Occasional laboratory sessions and field trips.
- 620 Natural Science as a Human Activity (1) I, II Newhouse
Seminar. The scientist; productivity in science; comparisons of several fields; anatomy of science; science and society. May be repeated.

Geography (Geog)

Professors BOWERS, CHANG, J. H., FRYER, FUCHS, KORNHAUSER, MANCHESTER, PITTS, WIENS; Associate Professors ARMSTRONG, CHANG, S.D., CLARKE, PIRIE, STREET; Assistant Professors CHAPMAN, EARICKSON, MURTON, SCHWIND, SOMMARSTROM; Lecturer PIANAIA

A 100 level course, or consent of the instructor, is prerequisite to all courses numbered over 299.

INTRODUCTORY COURSES

- 101 Elements of Physical Geography (3) I, II (2 L, 1 Lb) Street
Survey of man's natural environment; distribution and interrelationships of climates, vegetation, soils, landforms. Laboratory problems in map interpretation and environmental analysis.
- 102 World Regional Geography (3) I, II Bowers, Manchester
Geography of world's major cultural regions; emphasis on geographic aspects of contemporary economic, social, political conditions.
- 151 Economic Geography (3) I, II Sommarstrom
Locations, characteristics and relationships of economic activities. Elements of resource management, location theory, transportation and urban geography. Problems of the developed and underdeveloped worlds.

SYSTEMATIC PHYSICAL GEOGRAPHY

- 300 Introduction to Climatology (3) I** **J. H. Chang**
Elements and controls of climate. World patterns of insolation, temperature, evaporation, precipitation, atmospheric circulation. Climatic classifications. Pre: 101.
- 310 Physical Geography (3) II** **Street**
Nature, distribution and interrelationships of vegetation, soils, landforms. Readings in recent biogeographic literature. Pre: 101.
- 314 Geography of the Tropics (3) I** **Murton**
Analysis of physical environment and resource potential of tropics; problems of human use and occupation.
- 400 Advanced Climatology (3) II** **J. H. Chang**
Discussion of general circulation. Climatic characteristics of each continent. Emphasis on genesis and dynamism of climate. Regional climatic problems. Pre: 300 or equivalent.
- 415 Medical Geography (3) II** **Armstrong**
Areal distribution of disease indices and interrelationships with elements of physical, biological, cultural environment. Emphasis upon theoretical approaches to problems and research. Pre: 380 or equivalent. Biol 120 or Zool 101 or equivalent, or consent of instructor.
- 600 Seminar in Climatology (3) II** **J. H. Chang**
Methods of determining energy budget and water balance and their applications in agriculture, hydrology, climatic classifications. Theory of climatic changes. Bibliography of climatological literature. Pre: 300 or equivalent.

SYSTEMATIC CULTURAL GEOGRAPHY

- 326 Conservation of Natural Resources (3) I** **Sommerstrom**
Man's interaction with the environment. Changes in the concept of conservation. Ecological, philosophical and political aspects of present environmental dilemmas. Contemporary U.S. problems and international issues.
- 330 Population Geography (3) I** **Chapman**
Areal variation in distributions, densities, structures, internal dynamics of human populations. Emphasis on problems of Asia and the Pacific.
- 335 Political Geography (3) I** **Bowers**
Geographic background of international politics and national power. Case studies of problem areas and boundary problems.
- 339 Geography of Exploration (3) I or II** **Manchester**
Exploration, discovery and development of world map from classical times to present. Emphasis on Asia and Pacific. Pre: junior standing and an introductory course in geography.
- 351 Elements of Regional Science (3) I** **Earickson**
Spatial organization of economic activities. Concepts of location, interaction and economic change. Basic methods of regional and interregional analysis. Application to contemporary development problems. Pre: 151 or Econ 120 or consent of instructor.
- 420 Location Theory and Regional Analysis (3) I or II**
Location theories concerned with agricultural, manufacturing and tertiary activities and with urban systems. Basic methods of locational analysis. Paths towards application in regional economic planning. Identical to Econ 490. Pre: 151 or Econ 300-301 or consent of instructor. (Not offered 1969-70.)
- 421 Urban Geography (3) I** **Schwind**
Location, size, functions, spatial-economic structure of modern city. Urban sphere of influence. Problems of urban transportation, changes in land use and urban growth. Role of government in urban development. Pre: 151 or consent of instructor.

620 Regional Economic Analysis (3) I

Application to problems of regional economics of input-output analysis, linear programming, econometric analysis. Problems include optimal location of economic functions, population and migration, regional cycle and multiplier analysis. Identical to Economics 690. Pre: 420 or Econ 310, 494, or equivalent.

AREA COURSES

Each of the following courses covers, for the region concerned, the physical environment and resource base; evolution and present patterns of settlement, land utilization and economic activity; geographic aspects of population pressure, resource development and international relations.

340 Geography of the United States and Canada (3) I

Emphasis on evolution of present patterns of settlement and economic activity of U.S.

345 Geography of the Soviet Union (3) II**Fuchs**

The land and its people. The physical environment and resource base. Evolving problems of resource management, migration, urbanization, and economic development. Analysis of selected regions.

For information of the Russian Area Studies Certificate, see p. 64.

350 Geography of Asia (3) I**S. D. Chang**

Introduction to geographic analysis of East Asia, Southeast Asia, South Asia: physical setting, resource endowments, patterns of occupancy, problems of economic transformation. Not open to those who have taken 352, 355, or 356.

352 Geography of Japan (3) I**Manchester**

Regional synthesis of physical and cultural features which characterize economic, social, political geography of Japan. Emphasis on origins of these patterns.

353 Geography of China (3) I**Wiens**

Regional geographic exposition of historical, ethnic, political, economic character of China. Analysis of physical and resource base for agriculture and industry. (Not offered 1969-70.)

355 Geography of South Asia (3) II**Bowers**

Physical and human-use regions of India, Pakistan, Ceylon, Himalayan kingdoms. Geographic factors in history, politics, economics of the area.

356 Geography of Southeast Asia (3) II**Fryer**

Southeast Asia in world economy. Human and physical resources basis and returns achieved by various methods of land utilization. National economies of continental and insular Southeast Asia, problems and prospects of modernization.

361 Geography of Australia and New Zealand (2) I**Fryer**

Australia and New Zealand in the post war world. Physical environment and rural industries. Demographic movements, industrialization, urbanization.

365 Geography of the Pacific (3) I**Pirie**

Physical character of the Pacific and its islands; cultural, political, economic geography of Melanesia, Micronesia, Polynesia (except Hawaii).

368 Geography of Hawaii (3) II**Piianaia**

Regional, physical, cultural geography. Detailed study of the people and resources.

650 Seminar in Geography of Asia (3) I, II

(1) Asia, (2) China, (3) Japan, (4) Southeast Asia, (5) South Asia. Pre: consent of instructor. May be repeated.

665 Seminar in Geography of the Pacific (3) II**Pirie**

Investigation of geographic problems of Melanesia, Micronesia, Polynesia. Pre: consent of instructor. May be repeated.

TECHNIQUES AND METHODOLOGY

- 370 Airphoto and Image Interpretation (2) I, II (1 L, 1 Lb)** **S. D. Chang**
Quantitative and qualitative interpretation of photographic, infrared, radar imagery. Use of aerial photography, space photography, other remote sensors as tools for research in physical and social sciences. Pre: 101 or Geosc 102 or consent of instructor.
- 375 Cartography (3) I, II (2 L, 1 Lb)** **S. D. Chang**
Principles of cartography, including map scales, grid systems, map projection, compilation, symbolism, map reproduction. Laboratory practice with cartographic equipment; techniques of quantitative mapping and terrain presentation.
- 380 Quantitative Methods in Geography (3) I** **Armstrong**
Basic concepts and techniques: data collection, probability theory, tests of hypothesis, sampling methods, analysis of variance and regression, correlation analysis. Application to spatial problems.
- 680 Advanced Quantitative Methods in Geography (3) II** **Pitts**
Application to geographical research of advanced techniques. Variable topics may include multivariate analysis and regression, factor analysis, graph theory, linear programming, Fourier series and harmonic analysis, Markov chains, game theory. Pre: 380 and adequate math background. May be repeated.
- 685 Computer Applications in Geography (3) I** **Pitts**
Special purpose spatial computer programs; computer simulation. Students expected to solve individual research problems. Pre: 380 and some introduction to computer language.

READING, RESEARCH, GENERAL

- 390 Tutorial in Geography (3) II**
Concepts and methods in geographic analysis. Application to local problems through short field trips. Research on topics of special interest. Required of majors in junior year.
- 399 Directed Reading (arr.) I, II**
Limited to senior majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in geography.
- 638 Historical Geography (3) I** **Manchester**
Methodological approach to reconstruction of physical and cultural geography of an area at a specific time. Pre: consent of instructor, 601, and adequate background in physical geography and history. (Not offered 1969-70.)
- 690 Pro-Seminar in Geography (5) I** **Fuchs, Staff**
Bibliographical and field methods, research design; concepts and theory in regional physical, economic, cultural geography. Required of entering graduate students. Pre: consent of instructor.
- 691 History of Geographic Thought (3) II** **Manchester**
Development of geographic thought from early Greece to present. Emphasis on origins of current trends and relations to contemporary thought in natural and social sciences.
- 700 Seminar in Geography (3) I or II**
Study and discussion of significant topics and problems. May be repeated.
- 750 Research Seminar (3) I, II**
Selected problems in research. (1) Climatology, (2) biogeography, (3) medical geography, (4) resource management, (5) population geography, (6) economic geography, (7) urban geography, (8) geographic aspects of economic development, (9) cultural geography.
- 791 Field Camp (1) I**
Field research problems. Camp held between semesters on a neighbor island. Students expected to pay own travel and camp expenses. Pre: 690.
- 799 Directed Research (arr.) I, II**
Pre: consent of instructor.
- 800 Thesis Research (arr.) I, II**

Geosciences (Geosc)

Senior Professor MACDONALD; Professors ABBOTT, W. ADAMS, CHIU, COX, LAURILA, MURAKAMI, RAMAGE, ROSE, SUTTON, WOOLLARD; Associate Professors DAUGHERTY, FURUMOTO, MOBERLY, SADLER; Assistant Professors C. ADAMS, FAN, KHAN, MALAHOFF, MANGHNANI, PANKIWSKYJ, PETERSON, RESIG

101-102 or consent of instructor prerequisite to all courses above 204.

90 Earth Science Survey (6) I, II (two ½-hr TV lec/wk, one 3-hr Lb)

Survey of earth sciences emphasizing Hawaiian environment, designed for elementary and junior high school teachers, presented on ETV Channel 11. Saturdays 9-12 devoted to lab work, review, examinations, field trips. Topics include meteorology, physical oceanography, volcanology, geology, geophysics.

101-102 Introduction to Geosciences (4-4) Yr. (3 L, 1 Lb)

Both sections offered both semesters.

Integrated survey ranging from center of earth to limits of solar system, emphasizing unifying physical principles. 101: meteorology, oceanography, earth as a planet; 102: geology, solid earth geophysics emphasizing Hawaiian Islands (101 not pre.); field trips.

799 Directed Research (arr.) I, II

Pre: consent of instructor.

800 Thesis Research (arr.) I, II

Credit toward major may be granted in following courses:

Chemistry 133, 134, 432, 351, 352
Civil Engineering 320, 321, 322, 350, 424
Geography 300, 400, 375, 314, 600, 370
Oceanography 620, 622, 623, 625, 633
Soil Science 304, 460, 461, 661

GEODESY

457 Introduction to Geodetic Science (3) I

Laurila

Resections and intersections on plane. Parameters, defining ellipsoid, various latitudes, radii of curvature, geodesic, normal section, great elliptic, chords. Solution of ellipsoidal triangles, Legendre's method, Additament method. Direct and inverse solutions for short distances. Strength of figure. Mathematical projections of ellipsoid. Basic theory of electronic surveying. Pre: Math 206 or equivalent.

481 Potential Theory and Gravity (3) I

Furumoto

Potential theory, force fields, harmonic functions, Dirichler's problem as applied to earth's surface and external gravity field and magnetism. Concept of geoid and deflection of the vertical. Significance of gravity anomalies. Relation between earth's gravity field and its internal structure. Pre: Math 232 or consent of instructor.

482 Elements of Satellite Geodesy and Celestial Mechanics (3) II

Khan

Differential operators and integral theorems in vector analysis. Introduction to spherical harmonics. Motion of satellite in central force field. Significant perturbations. Elementary treatment to express disturbing potential in terms of Keplerian elements. Pre: 457 and Math 232 or consent of instructor.

681 Physical Geodesy I (3) I

Daugherty

Mathematical theory of physical geodesy. Solutions of boundary value problems of physical geodesy. Classical solutions involving reductions to geoid. Modern solutions involving solution of boundary value problems at earth's surface. Pre: concurrent registration in 481 and Math 232 or consent of instructor.

682 Physical Geodesy II (3) II

Daugherty

Problems connected with carrying out practical computations in physical geodesy. Accuracy of available gravity data. Methods of approximating gravity in unsurveyed areas. Numerical methods of computing geoid undulations and deflections of the vertical. Pre: 481, 681, or consent of instructor.

GEOSCIENCES

683 Satellite Geodesy (3) I

Khan

Methods of utilization of artificial satellites for geodetic purposes. Use of orbital perturbations for determination of gravitational field. Use of satellites in geometric geodesy. Pre: 681 and 686 or consent of instructor.

684 Advanced Geodesy (3) II

Laurila

Precision leveling. Baseline measurements. Orthometric and dynamic heights. Geodetic computations of arc lengths. Fundamentals of spatial coordinates in terrestrial geodesy. Changes in geodetic coordinates due to changes in reference ellipsoid. Direct and inverse problems for medium and long distances. Derivations of ellipsoidal projections. Differential formulae. Modern electronic surveying equipment, reductions and applications in geodesy. Pre: 457.

685 Adjustment Computation (3) II

Laurila

Theory of errors, distributions, systematic, random, criteria. Error propagation, weights of observations. Presentation of residuals. Adjustment of observations, least squares principle, observation equations, condition equations, applications to problems in geodetic science. Solution of normal equations, Gaussian method of substitutions, Cholesky-Rubin method. Standard errors and weights after adjustment, variances, covariances and functions. Error ellipses. Pre: 457 and Math 206.

687 Geodetic Astronomy (3) I

Introduction and review of spherical astronomy, celestial coordinate system, systems of time measurements, variations in star coordinates. Determination of second order astronomic positions. Determination of first order astronomic positions. Solar eclipses and occultations. Pre: 684 and 685.

GEOLOGY

300 Rocks and Minerals (5) I (3 L, 2 Lb)

Macdonald, Pankiowskyj

Elements of mineralogy, petrology, and structural geology. Pre: 102. Required for geology major.

301 Mineralogy (3) I (2 L, 1 Lb)

Pankiowskyj

Mineral structure, composition and identification by physical and X-ray techniques; crystal form and symmetry. Pre: Chem 113-117. (Not offered 1969-70.)

302 Petrology (3) II (2 L, 1 Lb)

Macdonald

Composition, classification, origin, occurrence of rocks. Pre: 301. (Not offered 1969-70.)

303 Structural Geology (2) II (1 L, 1 Lb)

Tectonophysics, structural analysis, interpretation of geologic maps. Pre: 300 or 302, Phys 170. Required for geology major.

305 Geological Field Methods (2) II (8 hrs. Saturday in field)

Abbott

Methods used in geological investigations in the field. Pre: 303, or concurrent registration. Required for geology major.

316 Geomorphology (3) II

Abbott

Study of landforms and their relation to geologic structure. Pre: 300, or consent of instructor. (Offered 1969-70.)

320 Marine Geology (3) I (2 L, 1 Lb)

Moberly

Survey of marine geologic processes and forms. Field work on occasional Saturdays involving marine geologic equipment and techniques.

410 Historical Geology (3) II (2 L, 1 Lb)

Moberly

Biological and temporal geology. Origin and evolution of earth and its life. Pre: 300, or 302.

411 Paleontology (3) II (1 L, 2 Lb)

Resig

Principles of paleozoology. Morphology and identification of fossils. Pre: 410 or Zool 101, or consent of instructor.

412 Micropaleontology (3) II (2 L, 1 Lb)

Resig

Morphology and taxonomy of microfossils and recent microscopic remains capable of fossilization. Ecologic-paleoecologic stratigraphic and sedimentologic significance of microbiota. Pre: consent of instructor.

- 415 Regional Geology (2) I (1 L, 1 Lb)** **Moberly**
Geologic framework of the earth, illustrated by North America and the Pacific Ocean Basin. Pre: 410.
- 424 Advanced Mineralogy (5) I (3 L, 2 Lb)** **Pankiwskyj**
Crystal symmetry, crystal chemistry, X-ray crystallography, optical mineralogy, use of petrographic microscope. Pre: 300 or 301, or consent of instructor.
- 425 Geochemistry (2) II**
Distribution of chemical elements in earth's crust and oceans, their relation to rock types and geologic processes. Pre: 300 or 302.
- 426 Advanced Petrology (3) II (1 L, 2 Lb)**
Petrogenic theory, microscopic and related laboratory studies of rocks. Pre: 424.
(a) Igneous, (b) Sedimentary, (c) Metamorphic. All three parts may be taken for credit.
- 430 Geology of Asia (2) I** **Fan**
Stratigraphy, structure and history of major geologic provinces of Asia. Pre: 300 or 302, or consent of instructor. (Alt. yrs.; offered 1969-70.)
- 440 Economic Geology (2-2) Yr.** **Abbott, Moberly**
(a) Origin and occurrence of metallic ores and industrial minerals; (b) origin and occurrence of mineral fuels. Both parts may be taken for credit. Pre: 300 or 302 and 303. (Alt. yrs.; not offered 1969-70.)
- 601 Seminar in Volcanology (2) II** **Macdonald**
Types and mechanisms of volcanic action. Pre: 300 or 302. (Alt. yrs.; offered 1969-70.)
- 602 Seminar in Petrology (2) II**
Seminars and lectures on origin and occurrence of igneous and metamorphic rocks.
(a) Igneous petrology (Pre: 426); (b) phase petrology (Pre: 425); (c) metamorphic petrology (Pre: phase petrology, 426). May be repeated for credit.
- 607 Seminar in Ore Deposits (2) II** **Abbott**
Consideration of physical and chemical processes and structural controls in formation of metalliferous ore deposits. Pre: 300 or 302, 303. (Alt. yrs.; not offered 1969-70.)
- 609 Seminar in Geomorphology (2) II** **Abbott**
Consideration of special problems and geologic processes in development of land forms. Pre: 316. (Alt. yrs.; not offered 1969-70.)
- 614 Advanced Field Study (arr.) I, II**
Field projects in geological sciences.
- 617-618 Seminar in Geotectonics (3-3) Yr.** **Moberly**
Evolution of the crust, from structure, petrology, geophysics, stratigraphy. 617: ocean basins and margins; 618: shields and mountain systems. (Alt. yrs.; not offered 1969-70.)
- 619-620 Sedimentology and Stratigraphy (3-3) I, II (2 L, 1 Lb)** **Moberly, Fan**
Lectures and seminars on physical, chemical, biological and temporal controls of sedimentation. Sedimentary petrology and stratigraphic analysis. Pre: consent of instructor. (Alt. yrs.; offered 1969-70.)
- 624 Topics in Geochemistry (3) I, II (2 L, 1 Lb)** **Pankiwskyj**
Discussion and laboratory work in analytical methods. (a) X-ray analysis and X-ray crystallography. I—Pre: 302. (b) Mineral equilibria at high and low temperatures and pressures. II—Pre: 302 and credit or registration in Chem 351-352.
- 625 Seminar in Current Research Topics (arr.) I, II**
(a) Paleontology; (b) applied geology; (c) marine geology; (d) regional geology; (e) geochemistry; (f) lunar and planetary geology; (g) ocean floor spreading. May be repeated for credit.

HYDROLOGY

- 306 Work of Water (4) II (3 L, 1 Lb)** **Peterson**
Dynamics of streams, waves, currents, ground water. Pre: 101-102.

GEOSCIENCES

455 Ground-Water Geology (4) I (3 L, 1 Lb)

Peterson

Occurrence, characteristics, movement, quality, development of water in earth's crust. Pre: 306 or consent of instructor.

605 Seminar in Engineering and Ground-Water Geology (3) I, II

Geologic controls on occurrence and development of ground water; geologic effects on man-made structures. Pre: consent of instructor. May be repeated for credit.

METEOROLOGY

342 Meteorological Instruments and Observations (3) II (2 L, 1 Lb)

Principles of meteorological instruments and their care; instrumental and visual weather observation; coding. Pre: credit or registration in Math 205. (Alt. yrs.; not offered 1969-70.)

350 Theoretical Meteorology Laboratory I (1) I (1 Lb)

C. Adams

Exercises related to Geosciences 352. Required for meteorology majors. Pre: credit or registration in Geosc 352.

352 Theoretical Meteorology I (3) I (3 L)

C. Adams

Atmospheric statics; optical acoustical, electrical phenomena; condensation and precipitation; radiation and heat balance; thermodynamics; kinematics. Pre: Phys 275; concurrent registration in 310, or consent of instructor.

353 Theoretical Meteorology II (3) II (3 L)

C. Adams

Basic concepts of fluid motion applied to atmosphere. Equations of motion; special cases of balanced motion; principles of numerical weather prediction. Pre: 352.

354 Theoretical Meteorology Laboratory II (1) II (1 Lb)

C. Adams

Exercises related to Geosciences 353. Required for meteorology majors. Pre: credit or registration in 353.

445 Tropical Meteorology (3) II

History; tropical clouds and hydrometeors; easterly waves and typhoons; monsoons; local and diurnal effects. Pre: 352. (Alt. yrs.; not offered 1969-70.)

450 Meteorological Analysis Laboratory (3) II

C. Adams

Techniques of portraying and analyzing atmospheric structure and weather systems in middle and high latitudes; modern methods of forecasting extratropical systems. Pre: credit or registration in 353. (Alt. yrs.; offered 1969-70.)

452 Tropical Analysis Laboratory (2) II

Techniques of portraying and analyzing atmospheric structure and weather systems in tropical and equatorial regions; modern methods of forecasting tropical systems. Pre: credit or registration in 353. (Alt. yrs.; not offered 1969-70.)

699 Meteorology of the Tropical Oceans (2) I (2 L)

Ramage, Sadler

Trade winds, typhoons, synoptic climatology, research exercises. Pre: Geosc 545 or consent of instructor.

640 Advanced Tropical Meteorological Laboratory (3) II (3 Lb)

Sadler

Modern methods of analysis and forecasting applied to the tropics. Pre: Geosc 639 or consent of instructor.

641 Monsoon Meteorology (3) II (3 L)

Ramage

Synoptic components of monsoons, regional and temporal variability, numerical models, research exercises. Pre: Geosc 639 or consent of instructor.

642 Atmospheric Turbulence (3) I

Chiu

Equations of motion for turbulent flow; turbulent diffusion; atmospheric boundary layer processes. Pre: 353. (Alt. yrs.; offered 1969-70.)

643 Cloud Physics (3) I

Physical processes attending formation and subsequent history of clouds and cloud particles. (Not offered 1969-70.)

644 Physical Meteorology (3) II

Advanced treatment of radiation, atmospheric optics, acoustics, electricity, visibility; radar meteorology. Pre: 352.

646 Statistical Meteorology (3) I

R. Jones

Frequency distributions of atmospheric variables, probability; correlation and regressions; time series analysis; statistical forecasting. Pre: Math 231.

745 Numerical Analysis and Prediction (5) I (3 L, 2 Lb)

Murakami

Theory and practice of objective analysis and numerical weather prediction; formulation of prediction equations, numerical integration procedures; programming of high-speed electronic computers.

750 Advanced Theoretical Meteorology I (3)

Chiu

Basic equations of meteorology in vector form and in various coordinate systems; circulation and vorticity theorems; classical hydrodynamics. Pre: 353 or equivalent; knowledge of ordinary and partial differential equations.

751 Advanced Theoretical Meteorology II (3) II

Chiu

Basic theories of the mechanics of compressible fluids; atmospheric waves and tides; stability problems. Pre: 750.

752 Special Topics in Meteorology (3) I, II

Concentrated studies on selected atmospheric problems. Pre: 751 or consent of instructor. May be repeated for credit.

765 Seminar in Meteorology (1) I, II

Chiu

(a) General. (b) Research results. May be repeated for credit.

SOLID EARTH GEOPHYSICS

351 Seismology (3) I

W. Adams

Elastic properties of rocks, behavior of earthquake waves; earthquake recording instruments; reading of seismograms. Pre: Phys 170. (Alt. yrs.; offered 1969-70.)

360 Principles of Geophysics (3) I

Rose

Physical laws and physical concepts which describe forces and materials of the earth. Pre: 101-102 (or concurrent registration), Phys 272.

463 Physical Properties of Earth Matter (3) I (2 L, 1 Lb)

Manghnani

Basic concepts of materials behavior, deformation of rocks and minerals, related rheological problems. Physical properties of crystalline solids under high pressure, with emphasis on laboratory study; equations of state.

465-466 Geophysical Exploration (4-4) Yr. (3 L, 1 Lb)

Malahoff, W. Adams

Theory and methods of exploration on land and sea by means of gravity, magnetic, seismic and electrical techniques. Pre: Math 206 (or concurrent registration). Alt. yrs.; not offered 1969-70.)

655 Seismic Source Mechanisms (3) II

W. Adams

Theoretical and observational study of source mechanisms for explosions and earthquakes in aerial, underwater, or underground environments. Pre: consent of instructor. (Alt. yrs.; offered 1969-70.)

656 Seismic Propagation Phenomena (3) II

Sutton, W. Adams

Propagation of energy through solid media having interfaces, with considerations of effects of heterogeneity and anisotropy. Pre: consent of instructor. (Alt. yrs.; offered 1969-70.)

657 Analysis and Synthesis of Seismograms (3) I

W. Adams, Furumoto

Development of theoretical seismograms for comparison with observed seismograms utilizing analytical and numerical techniques. Pre: consent of instructor. (Alt. yrs.; not offered 1969-70.)

658 Seismometry and Seismological Model Study (3) II

Sutton

Theoretical and practical investigations of seismological instrumentation; application of seismological model studies to interpretation of field observations. Selected topics from other areas in geophysics. Pre: consent of instructor. (Alt. yrs.; not offered 1969-70.)

660 Seminar in Solid Earth Geophysics (arr.) II

(a) Tectonics and crustal deformation. (b) Isostasy. (c) Properties of earth matter. (d) Physics of interior of earth. (e) Statistical interpretation. (f) Tsunamis. (g) Geomagnetism. Pre: consent of instructor. May be repeated for credit.

HISTORY

661 Marine Geophysics (3) II (2 L, 1 3-hr Lb)

Geophysical studies of ocean basin (primarily Pacific) by gravity, heat-flow, magnetic and seismic methods. Pre: 465 or 320 or 305 or Ocean 622. (Not offered 1969-70.)

662 Principles of Theoretical Geophysics (3) I

Furumoto

Continuum mechanics, potential theory, thermodynamics as applied to tectonics and physics of the earth's interior. Pre: Phys 310-311 or consent of instructor.

665 Numerical Methods in Geophysical Data Analysis (3) II

Loomis

Representation of observation by numbers, numerical filtering, power spectra, automatic data processing. Pre: Math 301, or 403, or 431 or consent of instructor. (Alt. yrs.; offered 1969-70.)

History (Hist)

Professors AKITA, COWING, HURWITZ, D. JOHNSON, W. JOHNSON, KWOK, MARGULIES, MAURER, MURPHY, NUNN, SAKAI, SHINODA, STALKER, STEIN, VAN NIEL, VELLA, J. WHITE; Associate Professors BEECHERT, DAWS, ERNEST, LAMLEY, J. McCUTCHEON, NEWBY, RAPSON, SAVILLE, SHARMA, SPEIDEL, WADE; Assistant Professors CONNORS, CUBBERLY, KANG, MAMMITZSCH, MCGLONE, MORRIS, TAO, WINCHESTER; Visiting Professors DE CASPARIS, NEWBURY; Assistant Professor LIND

151-152 World Civilization (3-3) Yr.

Connors, Saville, Mammitzsch

Development of civilization from its prehistoric origins to present. Prerequisite for advanced courses. (Freshmen and sophomores only.)

161-162 World Cultures in Perspective (3-3) Yr.

Problems in world history; development of ideas, institutions. Pre: consent of instructor. (Alternative for 151-152; freshmen only.)

241-242 Introduction to Asian History (3-3) Yr.

Sakai, Van Niel, Sharma

Historical survey of major civilizations of Asia from earliest times to present, including East Asia, Southeast Asia, and South Asia.

281-282 Introduction to American History (3-3) Yr.

Cowing, McGlone

Interpretive survey of U.S. history from earliest settlements to present.

351-352 Foundations of World Civilizations (3-3) Yr.

Winchester

Evolution of Eastern and Western civilizations from ancient times to present; emphasis on Western civilizations. Prerequisite for advanced courses. (Alternative for 151-152; juniors and seniors only.)

396 History Colloquium (3) I

Cowing

Examination of special problems in history, particularly those cutting across national boundaries such as totalitarianism, nature of wars, consequences of industrialism. Pre: consent of instructor. Recommended for honors students.

401-402 History of South Asia (3-3) Yr.

Stein

General historical survey of India, Pakistan, Ceylon, from earliest times to present.

405-406 History of Southeast Asia (3-3) Yr.

Van Niel, Casparis

Historical survey of Southeast Asian civilizations and states, including Burma, Thailand, Laos, Cambodia, Vietnam, Malaysia, Indonesia and Philippines.

409-410 History of China (3-3) Yr.

Lamley

Course of Chinese civilization from earliest times.

411-412 Social and Political History of Modern China (3-3) Yr.

Lamley

Analysis of conditions during the Ch'ing and Republican periods (1644 to present) with emphasis on selected topics portraying change and tension on the regional and local levels.

413-414 History of Japan (3-3) Yr.

Morris

Historical survey of Japanese culture, government, economics, institutions.

- 415-416 Imperial and Feudal Institutions of Traditional Japan (3-3) Yr.** **Morris**
Detailed treatment of political, economic, and social institutions to the 17th century. Pre: 413-414 or equivalent.
- 417-418 History of Korea (3-3) Yr.** **Kang**
Detailed political, economic and social survey of Korean history.
- 419 European Expansion (3) I** **Stein**
- 421 Australia and New Zealand (3) II** **Murphy**
Major historical developments from colonization to independent nationhood; present problems and policies.
- 422 History of Oceania (3) I** **Murphy**
European impact and native response in major groups, from exploration to exploitation to trusteeship. European or Pacific credit.
- 424 History of the Hawaiian Islands (3) II** **D. Johnson**
General course, but with some detail. Emphasis on period of monarchy. Interchangeable credit: Asian, Pacific or American.
- 425 The United States in the Pacific (3) I** **D. Johnson**
Growth of economic and political interests and policies in Pacific area. Interchangeable credit: Asian, Pacific or American. (Not offered 1969-70.)
- 426 The Ancient Near East (3) I** **Maurer**
Survey of the social, religious, political, and literary history of the peoples of Mesopotamia, Persia, and the eastern Mediterranean from Sumerian to pre-classical Greek times.
- 427 Ancient Greek History (3) II** **Speidel**
History, art, and culture of the archaic, classical, and Hellenistic ages.
- 428-429 Roman Civilization (3-3) Yr.** **Speidel**
History, art, and culture of the Roman republic and the Roman empire.
- 430 History of Science (3) I** **Bernatowicz**
Man's changing ideas concerning universe reflected against historical setting. Pre: one yr. of natural science. (Cross-listed with general science department.)
- 431-432 Medieval Europe, 300-1300 (3-3) Yr.** **Ernest**
Cultural, social, economic and political changes in development of European community.
- 435 Renaissance and Reformation, 1300-1600 (3) I** **Ernest**
Ideas and institutions in early period of commercial and national development.
- 437 Early Modern Europe, 1600-1800 (3) II** **Cubberly**
Thought and culture of Europe in age of expansion.
- 438 French Revolution, 1789-1815 (3) I** **Cubberly**
Louis XIV and eighteenth-century ferment. Jacobins and the Convention; Robespierre; Napoleon. Historiography, theories of causation, and nationalism will be stressed.
- 439 Europe in the 19th Century (3) I** **Winchester**
Major political, social, economic and intellectual trends in evolution of Europe from Napoleon to end of World War I.
- 440 Europe Since Versailles (3) II** **Winchester**
Problems of contemporary Europe and their historical background.
- 441-442 East Central Europe (3-3) Yr.** **Winchester**
General history of Poland, Danubian region and Balkans from Middle Ages to present. (Alt. yrs.; not offered 1969-70.)
- 443-444 History of Germany (3-3) Yr.** **Saville**
Major political, social, economic and intellectual trends in evolution of Germany. (Alt. yrs.; offered 1969-70.)
- 445-446 History of France (3-3) Yr.** **Cubberly**
Major political, social, economic and intellectual trends in evolution of France.

HISTORY

447-448 History of England (3-3) Yr. Lind

Major trends in development of English civilization from origins to contemporary period.

449-450 History of Russia (3-3) Yr. Wade

Survey of development of Russian thought and institutions, and of territorial expansion. Impact of revolutionary changes. Listed as course for Russian Studies Certificate, see p. 64.

451-452 Modern Russian and Soviet Foreign Policy (3-3) Yr. White

Territorial expansion; frontier and nationality questions: cultural, diplomatic, economic and ideological relations. Listed as course for Russian Studies Certificate, see p. 64.

453-454 Intellectual History of Russia and the Soviet Union (3-3) Yr. Wade

Religious and secular traditions, intellectual and social developments, political movements. Listed as course for Russian Studies Certificate, see p. 64.

455-456 European Intellectual History (3-3) Yr. Connors

Undergraduate seminar concentrating on great debates in Western thought from end of Middle Ages to 20th century. Emphasis on discussion of primary source materials and oral reports. Not a lecture course; therefore no auditors permitted.

459 Constitutional History of England (3) I, II Ernest

Anglo-Saxon institutions; Norman innovations; legal, administrative, parliamentary development under Angevins; rise of cabinet system. (Alt. yrs.; offered 1969-70.)

461 Colonial America to 1790 (3) I Cowing

Transit of European culture of North America, independence, Constitution.

462 The Young Republic: U.S. History 1789-1841 (3) II McGlone

Federalist decade, rise of Jeffersonianism, War of 1812, Age of Jackson.

463 Crisis of the Union: U.S. History 1841-1877 (3) I McGlone

National expansion, sectional conflict; Civil War and Reconstruction.

464 The Transformation of America: U.S. History 1877-1920 (3) II Margulies

Response to industrialism and emergence of U.S. as world power.

465 Troubled Peace: U.S. History 1920-1941 (3) I W. Johnson

The twenties, depression and New Deal, isolationism and involvement in World War II.

466 America and World Leadership: The U.S. Since 1941 (3) II Cowing

World War II, Cold War and beyond; politics from Roosevelt to Johnson; McCarthyism, civil rights; economic and social development.

471-472 Diplomatic History of the United States (3-3) Yr. McCutcheon, W. Johnson

History of American foreign policy and diplomacy.

475 Constitutional History of the United States (3) I Margulies

Origins and development of the constitution from colonial times to present. (Alt. yrs.; not offered 1969-70.)

477-478 Economic History of the United States (3-3) Yr. Beechert

Examination of the problems and process of development in the American economy. Role of the entrepreneur, agriculture, and labor are matters of special interest. Recommended pre: 281-282 and Econ 120 or 150-151.

480 History of Black Americans (3) II Newby

Achievements of Black Americans and their protests against racial repression and discrimination. Exploration of the meaning of Afro-American historical experience in the United States.

481-482 American Thought and Culture (3-3) Yr. Rapson

Advanced course in American social customs, institutions, intellectual pursuits.

483 The West in American History (3) I McCutcheon

Western expansion forces in development of economic, cultural, political trends of nation. (Alt. yrs.; not offered 1969-70.)

- 484 The South in American History (3) I** **Newby**
Southern economic, social, intellectual, political development, with special attention to race relations.
- 485 The City in American History (3) II** **McCutcheon**
Urban growth as factor in shaping social, economic, political, cultural life in U.S. (Alt. yrs.; not offered 1969-70.)
- 486 Representative Americans (3) I** **Stalker**
Series of biographical sketches of leading characters in American history from Revolution to present. (Alt. yrs.; offered 1969-70.)
- 487-488 History of Latin America (3-3)**
Political, economic, social development of Latin American republics from colonial times to present.
- 493-494 Senior Honors Thesis (2-2)**
Preparation of research paper under individual faculty supervision. Required for graduation with honors in departmental honors program.
- 497 Senior Tutorial in History (4)**
Analysis of sources and evaluation of methods of historical writing. Research in field of special interest. Required for majors, except those in honors program.
- 499 Directed Reading (arr.)**
Individual projects in various fields. Limited to senior majors with 2.7 grade-point average, or 3.0 in history. (1) American, (2) Pacific, (3) Japanese, (4) European, (5) English, (6) Chinese, (7) Russian, (8) Hawaiian, (9) South Asian, (10) Southeast Asian, (11) Korean.
- All courses 600-800, except 601 and 602, require consent of instructor.*
- 601 Seminar in Historical Method (3) I, II** **Saville**
Training in evaluation of sources and preparation of theses.
- 602 Seminar in Historiography (3) II** **Hurwitz**
History of history and historians.
- 611 Seminar in European History (3) I, II**
Selected problems for reading and research. (1) Ancient, (2) Medieval, (3) Early Modern, (4) Modern, (5) England.
- 618 British Empire and Commonwealth (3) II** **Newbury**
British Empire in modern times. (Alt. yrs.; offered 1969-70.)
- 619 Seminar in Russian History (3) I or II** **Wade**
Research in problems on history of Russia and Soviet Union.
- 620 Seminar in Russian Foreign Policy (3) I, II** **White**
Research in problems of foreign policy in Russia and Soviet Union.
- 631 Advanced Problems and Reading in American History (3) I** **Newby**
Interpretations and literature of important problems of American history.
- 635 The Colonial Period in American History (3) I** **Cowing**
Reading and research in political, social and intellectual history. Pre: 461 or equivalent.
- 636 Seminar in 19th Century American History (3) I** **McGlone**
Research in Early National Period, Jacksonian democracy, Civil War and Reconstruction. Pre: 462 or equivalent.
- 637 The Progressive Period in American History (3) II** **Margulies**
Research in problems relating to rise, character and decline of Progressive Movement, 1872-1924. Pre: 464 or equivalent. (Not offered 1969-70.)
- 638 Seminar in Recent American History (3) I** **W. Johnson**
Research in U.S. history since World War I. Pre: 465 or 466 or equivalent.
- 640 Seminar in American Social and Intellectual History (3) I or II** **Rapson**
Research in history of American thought and culture.

HISTORY

- 641 Seminar in American Diplomatic History (3) II**
Selected problems in development of U.S. foreign policy and its implementation.
- 654 Seminar in the History of Mainland Southeast Asia (3) I, II** Vella
Studies in histories of peoples and states of Burma, Thailand, Cambodia, Laos and Vietnam.
- 655 Seminar in the History of Island Southeast Asia (3) I, II** Van Niel
Studies in histories of peoples and states of Malaysia, Indonesia and Philippines.
- 661 Seminar in Chinese History (3) I, II** Kwok, Lamley
Problems and reading in political, social, cultural history of China.
- 663 Seminar in Indian History (3) I, II** Stein, Sharma
Selected problems and readings in history of India and influence of Indian culture in southern Asia, Individual reports. (1) Ancient India, (2) South India, (3) Muslim India, (4) Modern South Asia.
- 665 Seminar in Japanese History (3) I, II** Akita, Sakai, Morris
Selected problems in Japanese history; principal sources of bibliographic information. (1) Traditional period to c. 1600. (2) Early modern, 1600–1877. (3) Modern, 1868 to present.
- 667 Seminar in Korean History (3)** Kang
Research in selected topics in Korean history.
- 675 Seminar in Pacific History (3) II** Newbury
Selected topics and research papers in history of Oceania, with special emphasis on British colonies.
- 701 Research Materials and Methods in Asian History (3) I or II** Nunn
Training in bibliography and research methods in Asian history. Discussions and special problems.
- 719–714 Chinese Historical Literature (3–3) Yr.** Tao
Systematic reading and use of numerous genres of Chinese historical literature and documents. Chinese bibliography. Knowledge of Chinese required.
- 717–718 Chinese Intellectual History (3–3) Yr.** Kwok, Lamley
Intensive study in selected phases of history of Chinese thought and institutions. Pre: 409–410 or equivalent with consent of instructor. Knowledge of Chinese preferred but not required.
- 721–722 China From Classical Antiquity to 750 (3–3) Yr.** Tao
Detailed inquiry into foundations and elaborations of Chinese tradition. Pre: 409–410 or equivalent, with consent of instructor. Open to seniors with consent of instructor.
- 727–728 Japanese Historical Materials and Sources (3–3) Yr.** Sakai
Examination of different forms and styles of historical documents. Problems of terminology and interpretation. Reading knowledge of Japanese required.
- 730 Japan: The Bakumatsu Period (1830–1873) (3) I or II** Sakai
Analysis of structure and substance of feudal power; pressures for change; transition to the nation-state. (Not offered 1969–70.)
- 731 Seminar in Political History of Modern Japan (3) II** Akita
Bibliography, controversies and schools of thought among major Japanese political historians. Selected topics and research papers. Reading knowledge of Japanese required.
- 733–734 Japanese Intellectual History (3–3) Yr.** Shinoda
Intensive study in selected phases of history of Japanese thought and institutions. Pre: 413–414 or consent of instructor. Knowledge of Japanese preferred.
- 735–736 Seminar on Pre-Modern Japan C. 850–1800 (3–3) Yr.** Morris
Bibliography, research tools, special problems. Recent controversies among Japanese scholars. Reading knowledge of Japanese required.
- 799 Directed Research (arr.)**
Individual research topics in special fields. (1) American, (2) Pacific, (3) Japanese, (4) European, (5) English, (6) Chinese, (7) Russian, (8) Hawaiian, (9) South Asian, (10) Southeast Asian, (11) Korean.
- 800 Thesis Research (arr.)**

Linguistics (Ling)

Professors ELBERT, GRACE, LI, MCKAUGHAN, THOMPSON; Associate Professor BENDER;
Assistant Professors BAILEY, PARKER, ROBERTS, SCHÜTZ, STAROSTA, TOPPING, TSUZAKI;
Acting Assistant Professors HOWARD, LYOVIN, WARD

- 102 Introduction to the Study of Language (3) I, II**
Nature and workings of language; its role in culture and history.
- 320 General Linguistics (3) I, II**
Approaches, concepts, component areas of linguistics; its development as a science.
- 410 Articulatory Phonetics (3) I, II**
Intensive training in recognition, reproduction, recording of speech sounds throughout the world; preparing student for field work, especially with unrecorded languages.
- 421 Introduction to Phonological Analysis (3) I, II**
Introduction to phonemic analysis and phonological theory. Pre: 410, or concurrent registration.
- 422 Introduction to Grammatical Analysis (3) I, II**
Introduction to morphological and syntactic analysis, grammatical theory. Pre: 421, or concurrent registration.
- 611 Acoustic Phonetics (3) II**
Stream of speech analyzed according to acoustic properties and their function within given languages, with attention to articulatory correlates. Use of sound spectrograph in specific problems. Pre: 410.
- 615 The Nature of Language (3) I**
Language as communication system, current theories of grammar, meaning, sociolinguistics, linguistic change and comparison.
- 621 Phonology (3) I, II**
Phonological theory and problems of analysis. Pre: 421 or equivalent.
- 622 Grammar (3) I, II**
Grammatical theory and problems of analysis. Pre: 422 or equivalent.
- 630 Field Methods (3) I, II**
Work with native speakers of lesser-known languages to develop methods and techniques for collection and analysis of linguistic data. Pre: 621, 622 and consent of instructor.
- 645 Introduction to Comparative Method (3) I**
Fundamentals of comparative and historical method in linguistics with emphasis on Indo-European and attention to non-Indo-European languages having few or no written records. Pre: 421, 422 or consent of instructor.
- 650-651 Advanced Linguistic Analysis (3-3) Yr.**
Advanced problems and discussion of theory, techniques, procedures in linguistics. Pre: 621, 622 and consent of instructor.
- 699 Directed Research (arr.) I, II**
Pre: graduate standing; consent of instructor.
- 750 Seminar (3) I, II**
Reporting and discussion of current research in linguistics. Pre: consent of instructor. May be repeated.
- 760 Problems in Comparison and Pre-History (3) I, II**
Special problems dealing with areas of language classification, measures of language divergence, dialect geography, other phases of comparative-historical linguistic study. Pre: 645. May be repeated.
- 770 Areal Linguistics (3) I, II**
Seminar dealing with structures of languages of various areas of world, topics depending on both resident and visiting staff specialties. Pre: 622. May be repeated.

MATHEMATICS

780 Ethno-Linguistics (3) I

Seminar for advanced students of both linguistics and anthropology, dealing with methods and their application to research in these fields, with concentration on interrelations between culture and language. Pre: consent of instructor.

800 Thesis Research (arr.)

Mathematics (Math)

Professors CURTIS, FRASER, GREGORY, MOOKINI; Associate Professors GROTH, MADER, NOBU-SAWA, ROGERS, WEINBAUM, YEH; Assistant Professors CLARK, FRASER, GRISWOLD, HILDEN, JOHNSON, KOEHLER, SHUKLA, SIU, STERN, STOUT, WALLEN, WILLIAMSON, WONG

060 Algebra (0) I, II

Staff

Elementary and intermediate algebra, emphasizing concepts of function, identity, equation. Equivalent to 3 credits.

100 Survey of Mathematics (3) I, II

Staff

To acquaint non-specialists with position of mathematics in modern culture. Open to freshmen and sophomores who have not earned credit in 111 or above.

111 Introduction to Mathematics (3) I, II

Staff

Study of structure and concepts of number systems. (Primarily for Education majors.)

134 Pre-Calculus Mathematics (4) I, II

Siu

Algebraic operations as applied to elementary functions and equations; graphs, trigonometric functions; lines and conics. Pre: two years of high school algebra and one year of plane geometry, or consent of department.

201 Finite Mathematics (3) I, II

Staff

Algebra of sets, elementary probability theory, vectors and matrices, linear programming, theory of games. Pre: 134 or equivalent.

205 Calculus I (4) I, II

Staff

Basic concepts; techniques of differentiation; integration of algebraic and trigonometric functions with applications. Pre: 134 or equivalent.

206 Calculus II (4) I, II

Exponential, logarithmic and hyperbolic functions; techniques of integration; elements of three dimensional analytic geometry; multiple integration, infinite series; partial differentiation. Pre: 205 or equivalent.

231 Multi-Variable Calculus (3) I, II

Staff

Vector-oriented study of functions of several variables; elements of linear algebra, line and surface integrals, divergence and curl. Pre: 206.

232 Ordinary Differential Equations (3) I, II

Gregory

First order equations; linear equations with constant coefficients; system of equations, Laplace transforms; applications. Pre: 231.

301 Introduction to Numerical Analysis (3) I

Mookini

Iterative methods for algebraic problems, including convergence criteria and error analyses, interpolation and numerical integration. Pre: 231 and 232. 311 recommended.

311 Linear Algebra (3) I, II

Staff

Algebra of matrices, linear equations, real vector spaces and transformations. Pre: 231.

321 Elementary Topology (3) I

Sets, topologies, mappings. Continuity and convergence. Illustrations of use of these concepts in analysis. Pre: 311 or consent of department.

351 Foundations of Euclidean Geometry (3) I

Wong

Axiomatic Euclidean geometry and introduction to axiomatic method. Pre: 231 or consent of department.

- 352 Non-Euclidean Geometries (3) II** **Wong**
Study of hyperbolic geometry and other non-Euclidean geometries. Pre: 351 or consent of department.
- 402 Partial Differential Equations (3) I, II** **Staff**
Integral surfaces and characteristics of first and second order partial differential equations. Applications to equations of mathematical physics. Pre: 232.
- 403-404 Methods of Higher Analysis (3-3) Yr.** **Griswold**
Vector calculus, functions of complex variable, residue theory, conformal mapping; Fourier series and integrals, Laplace transformation, special functions, partial differential equations, calculus of variations. Pre: 232.
- 406 Difference Methods for Differential Equations (3) I** **Groth**
Finite differences, initial value problems for ordinary differential equations, finite difference methods for partial differential equations. Pre: 402 or 404 or equivalent.
- 412 Abstract Algebra (3) I, II**
Introduction to basic algebraic structures including groups, rings, fields. Pre: 311.
- 420 Introduction to the Theory of Numbers (3) I**
Congruences, quadratic residue, arithmetic functions, distribution of primes. Pre: 311 or consent of department.
- 431-432 Advanced Calculus (3-3) Yr.** **Staff**
Topology of R^n , theorems on continuous functions, development of Riemann integral, sequences and series, uniform convergence, implicit function theorems, differentials and Jacobians. Pre: 232, 311.
- 441 Numerical Analysis (3) II**
Theory of matrices in numerical analysis, norms and convergence. Pre: 301 and 311, and either 431 or 403.
- 442 Vector Analysis (3) II** **Staff**
Vector operations and their applications. Vector differential operators. Line and surface integrals. Theorems of Green and Stokes. Pre: 232.
- 444 Theory of Functions of a Complex Variable (3) II** **Williamson**
Analytic functions, complex integration, introduction to conformal mapping. Pre: 431.
- 471 Probability (3) I, II** **Yeh**
Probability spaces, random variables, probability distributions, functions of random variables, mathematical expectations, moment-generating functions and characteristic functions, limit theorems. Pre: 232.
- 472 Statistical Inference (3) II** **Fraser**
Sampling and parameter estimation, tests of hypotheses, correlation, regression, analysis of variance, sequential analysis, rank order statistics. Pre: 471.
- 499 Directed Reading (arr.) I, II** **Staff**
Individual reading in advanced mathematics. Limited to senior math majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in math.
- 611-612 Modern Algebra (3-3) Yr.** **Mader**
Simplicity of alternating groups, Sylow theorems, Jordan Holder theorem, unique factorization domains, Galois theory, algebraic closures, transcendence bases, modules over principal ideal rings, Dedekind domains. Pre: 412.
- 621-622 Topology (3-3) Yr.** **Wallen**
Properties of topological spaces; separation axioms, compactness, connectedness; metrizable; convergence and continuity. Additional topics from general and algebraic topology. Pre: 432.
- 631-632 Theory of Functions of a Real Variable (3-3) Yr.**
Lebesgue measure and integral, convergence of integrals, functions of bounded variation, absolute continuity, Lebesgue-Stieltjes integral and more general theory of measure and integration. Pre: 432.

MILITARY SCIENCE

644-645 Analytic Function Theory (3-3) Yr.

Williamson

Conformal mapping, residue theory, series and product developments, analytic continuation, special functions. Pre: 432, 444.

649 Topics in Mathematics (3) I, II

Staff

(1) Theory of groups, (2) analytic number theory, (3) Hilbert spaces. Pre: consent of instructor. May be repeated once for credit.

750 Seminar (1) I, II

Staff

Pre: consent of department chairman.

799 Directed Research (arr.) I, II

Staff

Pre: graduate standing in mathematics, consent of department chairman.

800 Thesis Research (arr.) I, II

Staff

Military Science (MS)

Professor ADAMSON; Associate Professor KENT; Assistant Professors DEBLOIS, MIYAMASU, SNYDER, VALENTINE; Instructors FOSTER, NORRIS

Leadership Laboratory required 1 hour per week

101-102 First-Year Military Science (2-2) Yr.

To develop an understanding of the ROTC program, US Army organization, missions and functions, and roles of the armed services relative to the national government, strategy, and security. To discuss types and evolution of warfare and weapons with emphasis on modern warfare and weapons. To develop awareness of the obligations of citizenship, objectives and instruments of national power and security. To provide progressive cultivation in leadership, military custom, military courtesy.

201-202 Second-Year Military Science (2-2) Yr.

Survey of American military history from origins of the American Army, with particular emphasis on factors influencing organizational, strategical, tactical and logistical patterns found in the present-day US Army. Introduction to small unit military operations and tactics to include organization, mission and method of operation of infantry and patrol-sized units. Develop techniques for reading maps and aerial photographs. Progressively apply functions, duties and responsibilities of junior leaders towards development of leadership potential.

301-302 Third-year Military Science (3-3) Yr.

To present instruction in and practical application of the principles and techniques of leadership and management. As a result of this instruction, student should develop individual capabilities and qualities inherent in a leader and a manager through self-discipline, integrity, and a sense of responsibility. To identify and illustrate effective leadership traits; to provide student with an understanding of factors affecting human behavior; to give student opportunities to apply leadership and management techniques, and to develop the student's proficiency in presenting instruction. Principles and techniques of leadership and management, including basic qualities of a leader; special problems of military leadership; delegation of authority and responsibility; span of control, planning, coordination, decision making.

401-402 Fourth-Year Military Science (3-3) Yr.

To provide advanced instruction in leadership and management skills and their practical application. An understanding of command and staff evolution, organization, and function, using the division staff as a model. Process for arriving at sound and timely decisions and translating decisions into plans with emphasis on the estimate of the situation, (mission, situation, analysis of courses of action, and decision). The value of military intelligence, its production and use, with special attention to provisions for safeguarding military intelligence. Composition and mission of various military teams with emphasis on the coordination and planning necessary between the various elements of the team. An understanding of the Army logistical system. Concepts and fundamentals of Army administration, military justice, Army readiness program, orientation on service life for future commissioned officers.

Music (Mus)

Professors RIAN, A. RUSSELL, L. ROWELL, B. SMITH, VAUGHT, VINE; Associate Professors KERR, R. N. MCKAY, A. TRUBITT; Assistant Professors CHADWICK-CULLEN, CRABTREE, KRANTZ, LUM, W. PFEIFFER, TRIMILLOS, UCHIMA, WOLZ; Instructors AH CHAN, CORAGGIO, GILLETT; Lecturers ALLTON, S. ARAI, T. ARAI, BURTON, DEMELLO, HARLING, HUH, KAEPLER, MIKAMI, MIYAMURA, NAKASONE, R. PFEIFFER, Z. RICHARDS, L. RUSSELL, P. VALENTIN, K. WONG, C. YAMADA; Assistant Professor WALZ

Numbers in parentheses in course descriptions refer to the different sections in each course and are used for scheduling purposes.

102 University Chorus (1) I, II

Gillett, Uchima

Performance of choral literature from Renaissance to present. Previous choral experience not required.

115-116 First-Level Secondary Piano (1-1) Yr.

Ah Chan

Study of piano as secondary performance field including application of music theory to problems in improvising, harmonizing, creating accompaniments, transposing and sight-reading at keyboard. For music majors.

117-118 Introduction to Music Theory (1-1) Yr.

Uchima

Fundamental concepts in musical structure and notation, including laboratory experience with vocal and instrumental performance at elementary level. Not open to those who have had 119.

119 Accelerated Introduction to Music Theory (2) I, II

Content of 117-118 in one semester. Placement conference required. Pre: consent of instructor. (Not offered 1969-70.)

123-124 Elementary Voice Class (1-1) Yr.

Basic principles of voice production. Relevant problems in voice literature at elementary level.

125-126 Elementary Piano Class (1-1) Yr.

Basic principles of piano performance. Relevant problems in piano literature at elementary level.

127-128 Asian Instruments Class (1-1) Yr.

Basic principles of performance of Asian instruments. Relevant problems in literature at elementary level. (78) shamisen, (79) koto. \$25 fee.

151-152 String Methods (2-2) Yr.

Krantz

For students preparing to teach instrumental music. Performance techniques, materials and pedagogy for string instruments.

153 Woodwind Methods (2) I

Uchima

Similar to 151-152.

154 Brass Methods (2) II

Lum

Similar to 151-152.

155 Percussion Methods (2) I

L. Russell

Similar to 151-152.

160 Introduction to Music Literature (3) I, II

Elements, styles and forms of music, from listener's point of view. Lab section required.

170 Music in World Culture (3) I, II

Role of music in societies—ancient and modern, sophisticated and non-sophisticated, Western and non-Western, child and adult. Representative styles and regional characteristics.

180 Fundamentals of Western Music (3) I, II

Trubitt

Fundamental concepts in organization of music as expressive medium in Western culture. Roles of composer, performer and listener. Notation as mode of communication. Discovery and verification of ideas through laboratory experience.

MUSIC

181-182 Elementary Music Theory (2-2) Yr.

McKay

Materials and organization of music; analysis, writing and keyboard application. Taken concurrently with 183-184. Placement conference required. Pre: consent of instructor.

183-184 Aural Training (1-1) Yr.

McKay

Systematic study of problems in perception, identification and notation of musical sounds. Emphasizes sight-singing. Taken concurrently with 181-182. Pre: ability to sing simple diatonic melodies at sight.

215-216 Second-Level Secondary Piano (1-1) Yr.

Ah Chan

Continuation of 115-116 with increased emphasis on piano literature up to intermediate level. Pre: 116 or consent of instructor.

265-266 History of Western Music (3-3) Yr.

Development of music from origin to present. Styles, schools, composers. Pre: 160 or 180 or 181 or consent of instructor.

281-282 Intermediate Music Theory (2-2) Yr.

Detailed study of theory of music; including writing, analysis, keyboard application. Taken concurrently with 283-284 and 265-266. Pre: 182.

283-284 Advanced Aural Training (1-1) Yr.

Systematic study of advanced problems in perception, identification and notation of musical sounds. Includes sight-singing. Taken concurrently with 281-282. Pre: 184.

325-326 Conducting (1-2) Yr.

Lum, Uchima

Problems in directing instrumental and choral ensembles and organizations. Score reading, rehearsal techniques and basic interpretive problems. Pre: 182.

351-352 Music in the Elementary School (2-2) Yr.

Gillett

For majors in elementary school music (vocal-general). Detailed study of music concepts and literature appropriate for elementary schools. Materials and procedures necessary for organization of music in childhood experience. Pre: 118 or 119 or 180 or 181.

353 Survey of Music in the Elementary School (3) I, II

Gillett

Study of music concepts and literature appropriate for elementary schools. Basic materials and procedures. Not intended for majors in elementary school music (vocal-general). Pre: 118 or 119 or 180 or 181.

358-359 Piano Methods (2-2) Yr.

Kerr

Concepts, materials and procedures for class and individual instruction in piano. Pre: 182 or consent of instructor.

370 Music in Modern America (3) I

Varieties of music, including jazz and other popular forms, in contemporary American society, with relevant antecedents. Pre: freshmen admitted only with permission of instructor. (Cross-listed as American Studies 370.)

399 Directed Study (arr.) I, II

Limited to senior majors with 2.7 grade-point ratio or 3.0 in music.

401 Ensembles (1) I, II

Performance of literature for ensembles and performing groups of various sizes and kinds: (12) University Chamber Singers, (21) Keyboard Accompanying, (22) Piano Duo, (23) Keyboard Chamber Music, (31) String Ensemble, (41) Woodwind Ensemble, (51) Brass Ensemble, (52) Stage Band, (61) Percussion Ensemble, (71) Koto Ensemble, (72) Japanese Ensemble, (73) Chinese Ensemble, (74) Korean Ensemble, (75) Okinawan Ensemble, (76) Philippine Ensemble, (77) Asian Ensemble, (78) Oceanic Ensemble, (81) Collegium Musicum, (82) Contemporary Music Ensemble, (91) Hawaiian Dance, (92) Japanese Dance, (93) Chinese Dance, (94) Korean Dance.

402 University Concert Choir (1) I, II

Crabtree

Performance of a cappella literature and major choral works. Pre: previous choral experience and consent of instructor. May be repeated for credit.

404 Opera Workshop (3) I, II

Opera in performance. Styles and characterizations. Performance of scenes and one complete work. May be repeated for credit. Pre: 236(11) or consent of instructor.

- 405 University Symphony Orchestra (1) I, II** **Krantz**
Performance of orchestral literature, including major works for chorus and orchestra, opera and dance. Pre: audition or consent of instructor. May be repeated for credit.
- 409 University Concert Band (1) I, II** **Lum**
Performance of band literature, including major works by contemporary composers. Pre: audition or consent of instructor. May be repeated for credit.
- 420 Music Literature Laboratory (2) I, II**
Specific areas of music literature with emphasis on problems of style and interpretation and their implications in performance. Inquiry with laboratory performance. (11) solo voice, (21) piano. May be repeated for credit.
- 451 Advanced String Methods (2)**
Advanced performance techniques, materials and pedagogy for string instruments: (31) violin, (32) viola, (33) cello, (34) double bass. Pre: 152. May be repeated for credit. (Not offered 1969-70.)
- 452 Advanced Woodwind Methods (2) II**
Advanced performance techniques, materials and pedagogy for woodwind instruments: (41) flute, (42) oboe, (43) clarinet, (44) bassoon. Pre: 153. May be repeated for credit.
- 453 Advanced Brass Methods (2)**
Advanced performance techniques, materials and pedagogy for brass instruments: (51) trumpet, (52) French horn, (53) trombone, (54) tuba. Pre: 154. May be repeated for credit. (Not offered 1969-70.)
- 455 Advanced Percussion Methods (2)**
Advanced performance techniques, materials and pedagogy for percussion instruments: (61) timpani, (62) mallet instruments, (63) snare drum. Pre: 155. May be repeated for credit. (Not offered 1969-70.)
- 457 Asian and Pacific Music in Education (2) II** **Gillett**
Musical concepts in songs, dances and instrumental music of Asia, Hawaii and other Pacific islands appropriate for elementary school. Pre: 352 or 353; teaching experience or consent of instructor.
- 458 Voice Methods (2) I** **Pfeiffer**
Concepts, materials and procedures for class and individual instruction in voice. Pre: 182 or consent of instructor.
- 461 Symphonic Music (2)**
Historical study of symphony orchestra and its literature from Bach to present. Pre: 160 or 180 or 181 or consent of instructor.
- 462 Choral Music (2)**
Historical study of choral literature from Palestrina to present. Pre: 160 or 180 or 181, or consent of instructor.
- 463 Opera (2) I**
Historical study of operatic literature from Monteverdi to present. Pre: 160 or 180 or 181, or consent of instructor. (Not offered 1969-70.)
- 464 Twentieth Century Music (2) II**
Study of major styles and composers from Debussy to present. Pre: 160 or 180 or 181, or consent of instructor. (Not offered 1969-70.)
- 469 Keyboard Music (2) II**
Study of literature for harpsichord, piano and organ from Renaissance to present, emphasizing development of historical styles. Pre: 160 or 180 or 181, or consent of instructor. (Not offered 1969-70.)
- 470 Art Music of Asia (2) II**
Major genres and representative works. Performance practices and compositional principles. Pre: 160 or 170 or 180 or 181, or consent of instructor.
- 471 Music of Non-Literate Peoples (3) II**
Traditional and acculturated styles, instruments, social context. Pre: 160 or 170 or 180 or 181, or consent of instructor.

MUSIC

481-482 Orchestration (2-2) Yr.

N. McKay

Basic principles of scoring for orchestra and band, including study of instrumental ranges, timbres, transpositions. *2nd Sem*: transcribing or composing for band, orchestra and chorus. Pre: 182, or consent of instructor.

483-484 Counterpoint (2-2) Yr.

Techniques of contrapuntal writing from beginnings of polyphony to 17th century (483) and from 17th century to present (484). Problems in writing and analysis. Pre: 282.

485-486 Form and Analysis (2-2) Yr.

Structural analysis of music literature from various style-periods, including standard form-types. Pre: 282.

487-488 Composition (2-2) Yr.

N. McKay

Creative writing beginning with smaller forms. Pre: 282 or consent of instructor.

489-490 Advanced Composition (2-2)

Creative writing in larger forms. Pre: 488 or equivalent. (Not offered 1969-70.)

491-492 Movement Notation (2-2) Yr.

Wolz

Analysis and recording of movement through Labanotation; reconstruction of notated exercises and dances.

493-494 Senior Honors Thesis (4) Yr.

519 Music for Elementary Teachers (3)

Music fundamentals; basic music skills and theory with emphasis on reading music. Sight singing, ear training through melodic and rhythmic dictation, creative activities, analysis of simple song forms, study of basic harmony with direct application to classroom instruments. Pre: 118 or 119 or 180 or consent of instructor. (Not offered 1969-70.)

580 Theoretical Aspects of Musical Style (3)

Study of concepts, and practices distinguishing baroque, classical, romantic, contemporary periods. Application in writing and listening. Pre: 182 and 266. (Not offered 1969-70.)

600 Seminar (3) I, II

Selected problems in (1) composition, (2) ethnomusicology, (3) musicology, (4) performance repertory, (5) music education. Pre: consent of instructor. May be repeated.

601 Advanced Ensemble (1) I, II

Selected projects in study and performance of ensemble literature. Pre: 436 or equivalent. May be repeated.

625-626 Advanced Conducting (2-2) Yr.

Advanced problems in conducting instrumental and choral groups. Pre: 326.

651 Foundations in Music Education (2) I

Discovery and organization of broad problems in music education. Relating basic concepts of music in elementary and secondary schools to total curriculum. Pre: teaching experience.

652 Problems in Music Education (2) II

Study of choral, instrumental, general music at elementary and secondary school levels. Research, reports and conferences. Pre: teaching experience. May be repeated.

660 Studies in Music Literature (3) II

Vaught

Detailed study of music literature approached from various standpoints, i.e., works of specific composers, forms or periods. Pre: 266 or consent of instructor. May be repeated.

661 Bibliography and Research Methods in Music (3) I

Smith

Basic materials and techniques for research in music.

670 Regional Musics (3) I, II

Musical content and historico-social context of principal musical traditions. (1) Asia, (2) Oceania. Pre: consent of instructor. May be repeated.

680 Advanced Problems in Music Theory (2) I, II

(1) Counterpoint, (2) form and analysis, (3) media, (4) pedagogy, (5) transcription

of performance practices, (6) movement notation. Pre: graduate standing and 282 or equivalent. May be repeated for credit.

699 Directed Work (arr.) I, II

Reading and research in ethnomusicology, musicology, or music education; reading and practice in theory, composition or performance. Pre: consent of instructor.

800 Thesis Research (arr.) I, II

APPLIED MUSIC

Instruction is given in individual lessons either a half-hour once or twice a week or an hour once a week. Lessons are not made up unless the instructor is notified a reasonable time in advance of the absence. Lessons occurring on holidays are not made up.

Registration for lessons and choice of teachers must be approved by the department chairman.

Assignment to applied music courses is based on tests and auditions given by the department during the advising and registration period.

Information regarding specific requirements in applied music courses may be obtained from the music department.

Fees Per Semester

One half-hour lesson per week.....	\$55.00
Two half-hour lessons or one hour per week.....	\$90.00

131 Introduction to Applied Music (arr.) I, II

Individual instruction in solo vocal or instrumental performance at the elementary level. Including study of works representative of literature. For non-music majors and music majors in secondary performance fields. May be repeated for credit. (11) Voice, (21) piano, (22) organ, (24) harpsichord, (25) harp, (31) violin, (32) viola, (33) cello, (34) double bass, (35) viola da gamba, (41) flute, (42) oboe, (43) clarinet, (44) bassoon, (45) saxophone, (51) trumpet, (52) french horn, (53) trombone, (54) tuba, (55) baritone, (61) percussion, (71) koto, (72) shamisen, (79) Hawaiian chant, (91) Japanese dance, (94) Korean dance, (96) Philippine dance.

135-136 First-Level Applied Music (arr.) I, II

For music majors or intended majors. Individual instruction in solo vocal or instrumental performance at first performance level. Study of works representative of the literature. Weekly repertoire laboratory required. (11) Voice, (21) piano, (22) organ, (25) harp, (31) violin, (32) viola, (33) cello, (34) double bass, (41) flute, (42) oboe, (43) clarinet, (44) bassoon, (45) saxophone, (51) trumpet, (52) french horn, (53) trombone, (54) tuba, (55) baritone horn, (61) percussion. Pre: audition.

231 Intermediate Applied Music (arr.) I, II

For non-music majors or music majors in secondary performance fields. Individual instruction in solo vocal and instrumental performance at second performance level. Study of works representative of the literature. See 131 for list of sections. Pre: audition. May be repeated.

235-236 Second-Level Applied Music (arr.) I, II

For music majors or intended music majors. Individual instruction in solo vocal or instrumental performance at second performance level. Study of works representative of literature. Weekly repertoire laboratory required. See 135 for list of sections. Pre: 136 or consent of instructor.

335-336 Third-Level Applied Music (arr.) I, II

For music majors. Individual instruction in solo vocal or instrumental performance at the third performance level. Study of works representative of literature. Weekly repertoire laboratory required. Half recital required in 336. See 135 for list of sections. Pre: 236 or consent of instructor.

431 Advanced Applied Music (arr.) I, II

For students not majoring in music performance. Individual instruction in solo vocal or instrumental performance at third and fourth performance levels. Study of works representative of literature. No recital requirement. See 131 for list of sections. Pre: 336 or consent of instructor. May be repeated.

OCEANOGRAPHY

435-436 Fourth-Level Applied Music (arr.) I, II

For majors in music performance. Individual instruction in solo vocal or instrumental performance at fourth performance level. Study of works representative of literature. Weekly repertoire laboratory required. Full recital required in 436. Pre: 336 or consent of instructor. See 135 for list of sections.

635 Graduate-Level Applied Music (arr.) I, II

Individual instruction in solo vocal or instrumental performance at graduate performance level. Study of works representative of literature. (11) Voice, (21) piano, (31) violin, (32) viola, (33) cello, (34) bass, (41) flute, (42) oboe, (43) clarinet, (44) bassoon, (45) saxophone, (61) percussion. Pre: 436 or equivalent. May be repeated.

636 Graduate Recital (3) I, II

For candidates for M.M. in performance. Individual instruction in solo vocal or instrumental performance at graduate performance level; full recital required. (11) Voice, (21) piano, (31) violin, (32) viola, (33) cello, (34) bass, (41) flute, (42) oboe, (43) clarinet, (44) bassoon, (45) saxophone, (61) percussion.

Oceanography (Ocean)

Professors BROCK, CHAVE, GROVES, MURPHY, WYRTKI; Associate Professors CAPERON, CLUTTER, STROUP; Assistant Professors ANDREWS, CATTELL, CLARKE, GALLAGHER, GORDON, MALAHOFF, ROY, YOUNG; Professors DIETRICH, HARDY

201 Science of the Sea (3) I, II

Caperon, Stroup

Introduction to biological, geological, chemical, physical aspects of oceanography. Based on classroom lectures and use of oceanographic equipment and techniques at sea aboard ship and in near-shore zone.

620 Physical Oceanography (3) I

Wyrcki

Introduction to properties of sea water, oceanographic instruments and methods, heat budget, general ocean circulation, formation of water masses, dynamics of circulation, regional oceanography, waves, tides, sea level. Pre: Math 206.

621 Biological Oceanography (3) II

Brock

Marine organisms, factors governing productivity; distribution, ecology, environmental influences; marine resources, their availability and utilization. Desirable preparation: 620.

622 Geological Oceanography (3) II

Andrews

Marine geological processes and forms, including ocean basin structure and geomorphology, near-shore processes, marine sedimentation and stratigraphy.

623 Chemical Oceanography (3) I

Gordon

Study of chemical processes occurring in marine waters with emphasis on why they occur and how they affect the oceanic environment. Pre: Chem 133-134 and consent of instructor.

630 Physical Oceanography Laboratory (1) I

Wyrcki

Techniques and methods of analysis in physical oceanography. Pre: Math 232 and consent of instructor.

632 Littoral Geological Processes (3) I (2-3 hr. L-Lb)

Staff

Geological processes and forms peculiar to near-shore marine environment. Pre: 620, 622.

633 Chemical Oceanography Laboratory Methods (1) I

Gordon

Laboratory and field analytical techniques used in chemical oceanography. Pre: Chem 133-134 and consent of instructor.

636 Phytoplankton Ecology (2) II (1 L, 1 3-hr. Lb)

Cattell

Phytoplankton-environmental relations and community ecology; phytoplankton-zooplankton interactions; plankton community synecology. Pre: 620, and consent of instructor.

- 640 Advanced Physical Oceanography (3) II** **Wyrski**
Dynamics of ocean currents; equations of motion and continuity; ocean circulation; heat budgets. Pre: 620, Math 402.
- 642 Recent Marine Sediments (3) II (2 3-hr Lb)** **Roy**
Composition and distribution of recent marine sediments. Marine sedimentary environments. Pre: 622, 623.
- 643 Marine Geochemistry (3) II** **Chave**
Origin and history of oceans, isotope geochemistry, sedimentary cycle, biogeochemistry. Pre: 622, 623.
- 644 Marine Geological and Geophysical Techniques (3) I** **Malahoff**
Applications of established sea-borne geological and geophysical exploration techniques to study composition and configuration of ocean floor and sub-bottom structure. Use of physiographic and structural interpretation techniques. Pre: consent of instructor.
- 646 Zooplankton Ecology (2) I** **Clutter**
Sampling, distribution patterns, population dynamics, community structure and energy flow in the pelagic environment. Pre: 620, consent of instructor.
- 647 Zooplankton Ecology Laboratory (2) I (2 3-hr Lb)** **Clutter**
Application of sea and laboratory techniques, analysis and interpretation of concepts introduced in 646. Pre: 646 (may be taken concurrently), consent of instructor.
- 660 Ocean Wave Theory (3) II** **Groves**
Generation and propagation of waves at sea; tsunamis; internal waves; observation and recording of ocean waves; wave spectra and forecasting. Pre: either 640, Math 432 and consent of instructor.
- 661 Tides (3) I** **Groves**
Mechanics of particles and finite bodies; tide-generating forces; response of ocean and earth; harmonic and non-harmonic methods of analysis and prediction, geophysical implications of the tide. Pre: either 640, Math 432, and consent of instructor.
- 662 Marine Hydrodynamics (3) I** **Gallagher**
Introduction to classical hydrodynamics and development of Navier-Stokes equations as applied to oceans. Techniques for solution on various scales of oceanic motion, including turbulence, potential theory, dimensional analysis, vertical integration, boundary effects and statistical representations. Pre: Math 432 and consent of instructor.
- 663 Measurements and Instrumentation (2) I** **Graefe**
Oceanographic measurements, their accuracy and precision. Design principles and operation of selected instruments for physical oceanography. Reduction and evaluation of measured data.
- 672 Ocean Basins (3) II** **Malahoff**
Origin, structure, geomorphology of ocean basins. Pre: consent of instructor.
- 673 Continental Shelves (3) I** **Andrews**
Geological structure and mineral resources of continental shelves. Pre: consent of instructor.
- 699 Directed Research (arr.) I, II** **Staff**
Pre: consent of instructor.
- 701 Nekton Ecology (3) II** **Clarke**
Ecology of larger oceanic animals, patterns of life history, population ecology, and community structure as related to the physical and biological environment. Pre: 620, 621 and consent of instructor.
- 735 Seminar in Oceanography (2) I, II** **Staff**
1969 Fall semester. Turbulence in the Ocean (Gallagher). Sublittoral geological processes (Roy).
- 750 Topics in Biological Oceanography (2) I, II** **Staff**
Seminar. Literature and concepts in one of several active fields of biological oceanography considered in detail. Pre: consent of instructor. May be repeated for credit.

OVERSEAS CAREER PROGRAM; PHILOSOPHY

- 760 Topics in Physical Oceanography (2) I** Staff
Review of recent development in theoretical oceanography with emphasis on problems of oceanic circulation. Pre: consent of instructor.
- 770 Seminar in Chemical Oceanography (1) II** Chave, Gordon
- 800 Thesis Research (arr.) I, II** Staff

Overseas Career Program (OCP)

Professor ALLISON; Associate Director HACKLER

- 631-632 Overseas Career Training Seminar (3-3) Yr.** Allison
Interdisciplinary study of problems of Americans living and working in Asia with emphasis on application of regional and individual country studies, and practical aspects of interaction of American and Asian cultures. Consideration of overseas career services, such as U.S. Foreign Service, and study of case histories of positions available to Americans in various Asian countries. Open only to graduate students; required of all candidates for Overseas Career Certificate.

- 791 Internship in an Asian Country (3)** Hackler
Active duty for 6 months (in some cases up to 12) with governmental or private agencies in Asia. Periodic and final reports required. Limited to candidates for Overseas Career Certificate.

See Graduate Division Bulletin for description of Overseas Career Program and requirements for the Overseas Career Certificate.

Philosophy (Phil)

Professors CHANG, COPI, DEUTSCH, MCCARTHY, NAGLEY; Associate Professors CHENG, INADA; Assistant Professors BENDER, BORGMANN, MANLEY, MOORE, STEWART, WARGO, WINNIE, YAMASAKI

One of the following is generally a prerequisite to each advanced course: 100, 200, 201, 210 or the equivalent.

- 100 Introduction to Philosophy (3) I, II**
Problems, methods, fields of philosophy.
- 200 History of Philosophy I (3) I**
Western philosophy from era of great Greek thinkers to Renaissance.
- 201 History of Philosophy II (3) II** Stewart
Western philosophy from Renaissance to present. Desirable preparation: 200.
- 210 Introduction to Logic (3) I, II**
Principles of modern deductive logic.
- 300 Greek Philosophy (3) I**
Basic philosophical works of schools and thinkers of Greek philosophy from Pre-Socratics to Neo-platonism.
- 302 Medieval Philosophy (3) II** McCarthy
Metaphysical, epistemological, ethical problems of medieval philosophy, with particular reference to Augustine, Anselm, Thomas Aquinas, Duns Scotus and William of Ockham.
- 304 British Empiricism (3) II** Winnie, Yamasaki
Analysis of development of empiricism in writings of Locke, Berkeley and Hume. Special attention to concepts of substance, sensation, self, nature, causation, mathematics, morality, religion.

- 306 Continental Rationalism (3) I** **Yamasaki**
Epistemological, metaphysical, ethical problems in Continental Rationalism. Particular attention to Descartes and Spinoza.
- 308 Nineteenth Century Philosophy (3) I** **Nagley**
Major philosophical writings of German Idealists from Kant through Hegel and of Marx, Kierkegaard, Nietzsche, Freud.
- 310 20th-Century Philosophy (3) II** **Deutsch, Stewart**
Survey of recent developments in Western philosophy.
- 315 Ethical Theory (3) I** **Manley**
Comparative analysis of ethical theory in theological, legal, literary, scientific, social, as well as philosophical sources indicating relevance of ethical theory to processes of decision making.
- 400 Political Philosophy (3) II** **Bender**
Combined systematic and historical approach to major problems of Western political philosophy. Special attention to European political theory.
- 401 Social Philosophy (3) I** **Bender**
Traditional problems of justice, freedom, equality and authority and their contemporary analyses.
- 405 American Philosophy (3) I** **Cheng**
Major trends in development of American philosophy in relation to socio-political background and influence.
- 410 Philosophy of the Physical Sciences (3) I** **Winnie**
Systematic study of methods and procedures in formal and natural sciences. Pre: 210.
- 415 Philosophy of the Social Sciences (3) II** **Winnie**
Substantive methodological problems in current analyses of social sciences.
- 417 Theory of Knowledge (3) II** **Winnie**
Examination of major historical and contemporary approaches to the theory of knowledge. Problems to be considered will include: truth and error, scepticism, the problem of induction, the possibility of *a priori* knowledge, the analytic-synthetic distinction, meaning and verification, perception, and other minds.
- 420 Philosophy of Art (3) I** **Manley**
Study of art from points of view of creation, appreciation, criticism. Particular attention to painting, sculpture, music, poetry.
- 422 Philosophy and Psychoanalysis (3) II** **McCarthy**
Contributions of psychoanalysis to the philosophical understanding of the nature of man, society, art, religion and morality.
- 425 Philosophy in Literature (3) I** **McCarthy**
Literary expression of philosophical ideas. Consideration of such writers as Beckett, Camus, Hemingway, Kafka, Rilke, Sartre, T. S. Eliot.
- 427 Kafka (3) II** **McCarthy**
Philosophical-literary analysis of the major writings of Franz Kafka: novels, stories, journals, philosophical reflections. Pre: 425; or consent of instructor.
- 430 Existential Philosophy (3) II** **Nagley**
Survey of main themes of European existential philosophy. Particular attention to Kierkegaard and Heidegger.
- 435 Philosophy of Religion (3) II** **Yamasaki**
Problems concerning existence of God, nature of religious experience, faith and reason, immortality, religious language, alternatives to theism.
- 445 Symbolic Logic I (3) I** **Copi**
Intermediate level course designed to impart the techniques of symbolic logic, both the propositional calculus and first order predicate calculus. Pre: 210 desirable preparation.
- 493-494 Senior Honors Thesis (2-2) Yr.**

PHILOSOPHY

- 600 Problems of Philosophy (3) II** **McCarthy**
Persistent specific problems of philosophy, primarily those concerning nature, man, God. Pre: graduate standing; consent of instructor.
- 604 Metaphysics of Language (3) I** **Borgmann**
Ontological and historical dimensions of language in metaphysical tradition of Plato, Aristotle, Buridan, Vico, Humboldt.
- 605 Philosophy of Language (3) II** **Cheng**
Concepts of meaning, truth, existence, reference, predication, quantification; analysis of analyticity and modalities with applications to philosophy, science, art.
- 611 Symbolic Logic II (3) II** **Copi**
Basic course in the theory of logistic systems covering both the sentential and first order functional calculus. Pre: 445.
- 700 Individual Western Philosophers (3) I, II**
Philosophies of men such as Plato, Aristotle. Thomas, Kant, Hegel, Kierkegaard, Schopenhauer. Pre: graduate standing; consent of instructor.
- 715 Philosophy of Mathematics (3) II** **Cheng**
Philosophical problems concerning mathematics—mathematical truths, axioms, proof. Emphasis on contemporary research on foundations of math. Pre: 710 or 12 credits in math; consent of instructor.
- 720 Seminar in Ancient-Medieval Philosophy (3) I**
Pre: graduate standing; consent of instructor.
- 725 Seminar in Modern Classical Philosophy (3) I, II**
Pre: graduate standing; consent of instructor.
- 730 Seminar in Contemporary Philosophy (3) I, II**
Pre: graduate standing; consent of instructor.
- 740 Seminar in Philosophy of Science (3) I**
Pre: graduate standing; consent of instructor.
- 799 Directed Research (arr.) I, II**
(a) Greek philosophy, (b) modern classical philosophy, (c) contemporary philosophy. Available to advanced graduate students; consent of instructor and chairman required. May be repeated.

ASIAN AND COMPARATIVE

- 450 Indian Philosophy (3) I** **Deutsch**
Philosophical systems and movements: Vedas, Upanishads, six systems of Hinduism, Charvaka, Jainism, Buddhism.
- 460 Buddhist Philosophy (3) II** **Inada**
Survey of basic schools and tenets of Buddhist philosophy.
- 470 Chinese Philosophy (3) I** **Chang, Cheng**
Historical survey of important philosophical schools and tendencies in China, ancient and modern.
- 480 Philosophy, East and West (3) I** **Deutsch**
Basic systems and methods of Eastern and Western philosophy, with special attention to similarities and contrasts.
- 485 Modern Japanese Philosophy (3) II** **Wargo**
Systematic survey of the history of development of Japanese philosophy in the modern period, from mid-19th century to the present.
- 650 Individual Asian Philosophers (3) I, II**
Philosophies of men such as Ramanuja, Shankara, Confucius, Chuang Tzu, Nagarjuna, Nishida. Pre: 450, 460, or 470; consent of instructor.
- 655 Vedanta (3) I**
Development and many facets of Vedanta examined in their richness and complexity. Pre: 450; consent of instructor.

656 Indian Social Philosophy (3) II

Basic codes of Indian moral and social philosophy (Dharma-sastras) and their historical developments and practical significance. Pre: 450; consent of instructor.

660 Theravada Buddhist Philosophy (3) I

Inada

Analysis of early Buddhist conceptions of the nature of man. Pre: 460; consent of instructor.

661 Mahayana Buddhist Philosophy (3) II

Inada

Basic principles and major schools. Emphasis upon Indian, Chinese, and later Japanese developments. Pre: 460; consent of instructor.

662 Zen (Ch'an) Philosophy (3) I

Chang, Inada

Origin and development of Zen; influence on Oriental cultural traditions and contemporary scene. Pre: 460; consent of instructor.

670 Confucianism (3) I

Cheng

Doctrinal, ethical, social, institutional problems of Confucius to the present. Pre: 470; consent of instructor.

671 Neo-Confucianism (3) II

Chang, Cheng

Examination of logic, theory of knowledge, metaphysics, and ethics of major Chinese Neo-Confucian philosophers in period from 11th to 16th century. Pre: 470; consent of instructor.

672 Taoism (3) II

Chang

Study and analysis of philosophical ideas of Lao Tzu, Chuang Tzu, and later Neo-Taoists. Pre: 470; consent of instructor.

750 Seminar in Indian Philosophy (3) I, II

Pre: 450; graduate standing; consent of instructor.

760 Seminar in Buddhist Philosophy (3) I, II

Chang, Inada

Pre: 460; graduate standing; consent of instructor.

770 Seminar in Chinese Philosophy (3) II

Chang, Cheng

Pre: 470; graduate standing; consent of instructor.

780 Seminar in Comparative Philosophy (3) II

Deutsch

Pre: graduate standing; consent of instructor.

799 Directed Research (arr.) I, II

(d) Indian philosophy, (e) Buddhist philosophy, (f) Chinese philosophy, (g) East-West philosophy. Available to advanced graduate students; consent of instructor and chairman required. May be repeated.

800 Thesis Research

Physics (Phys) and Astronomy (Astr)

Senior Professor K. WATANABE; Professors HENKE, HOLMES, JEFFERIES, ORRALL, PETERSON, PONG, SINTON, STEIGER, TUAN, M. S. WATANABE, J. ZIRKER; Associate Professor BONSAK, CENCE, McALLISTER, STENGER, WOLSTENCROFT; Assistant Professors BOESGAARD, DOBSON, HAYES, NOSE, PAKVASA, PETERS, SHYU, WOLFF; Associate Professor YOUNT

Mathematics 231 and Physics 160-161 or 170-273 are prerequisites to all courses numbered 300 or above.

100 Survey of Physics (3) I, II

Introduction to physics; basic concepts. Not open to those with previous college physics or experience beyond Math 134.

101 Laboratory I, II

Simple experiments in basic concepts of physics. Pre: credit or concurrent enrollment in 100.

PHYSICS AND ASTRONOMY

110 Astronomy (3) I

Survey of nature of astronomical universe, with much emphasis on scientific method and development of scientific thought. Pre: high school trigonometry.

111 Astronomy (3) II

Selected topics in astronomy considered in depth. Emphasis on current research problems. Occasional evening observing sessions. Pre: high school trigonometry.

160-161 College Physics (4-4) Yr. (3 L, 1 Lb)

Fundamental principles, theories, experimental methods. Pre: credit or registration in Math 134.

170 General Physics (4) I, II

Mechanics of particles and rigid bodies; kinetic theory and thermodynamics. Pre: credit or registration in Math 206.

171 Experimental Analysis in Mechanics and Thermodynamics

(1) I, II (1 3-hr Lb)

Pre: credit or registration in 170.

264 Elementary Modern Physics (4) I

Special theory of relativity, introduction to quantum mechanics, atomic structure, electrons in solids, selected topics of nuclear physics. Pre: 161 or equivalent, credit or registration in Math 206.

272 General Physics (3) I, II

Electricity and magnetism; wave motion; optics. Pre: 170, 171.

273 Experimental Analysis in Electricity and Magnetism and Optics

(1) I, II (1 3-hr Lb)

Pre: credit or registration in 272.

274 General Physics (3) I, II

Relativity, introduction to quantum mechanics, atomic and nuclear physics. Pre: 272, 273 or 160, 161; credit or registration in Math 231.

275 Experimental Analysis in Modern Physics (1) I, II (1 3-hr Lb)

Pre: credit or registration in 274 or 264.

305-306 Modern Physics Lab (1-2) I, II

Selected important experiments in modern physics. Measurements of nuclear magnetic resonance, Mossbauer effect, electron spin resonance, lasers, electron diffraction, other phenomena. Pre: 275, credit or registration in 480, or consent of instructor.

310 Theoretical Mechanics I (3) I

Particle dynamics, rigid body dynamics, planetary motion. Pre: credit or registration in Math 232.

311 Theoretical Mechanics II (2) II

Rigid body mechanics continued, fluid dynamics, wave motion. Pre: 310.

350 Electricity and Magnetism (3) I

Experimental laws, field theory, mathematical application to special problems. Pre: credit or registration in Math 232.

399 Individual Work in Advanced Physics (arr.) I, II

Limited to physics majors with 2.7 grade-point ratio or 3.0 in physics.

400 Applications of Mathematics in the Physical Sciences (3) I

Applications of mathematical techniques and methods to the problems of the physical sciences. Emphasis on choice and analysis of mathematical models. Pre: Math 232.

421 Astrophysics I (3) I

Methods of observation, physical theory, and interpretation of radiation from single stars, stellar spectra. Discussion of the accuracy of the data and the limitations of the physical theory. Pre: 274 and Math 232.

422 Astrophysics II (3) II

Methods of observation, physical theory, and interpretation of radiation from groups of stars and the interstellar gas. A special topic of current interest in astronomical research will be discussed during the last 3-4 weeks to exemplify concepts learned in 421-422. Examples of such topics are: star formation, close binary systems, solar and stellar coronae. Pre: 421.

490 Thermodynamics and Statistical Mechanics (3) II

Laws of thermodynamics, heat transfer, kinetic theory, statistical mechanics. Pre: Math 232.

440 Solid-State Physics (3) I, II

Physics of electronic processes in solids. Pre: 274 or 264, credit or registration in 350 or equivalent.

450 Electromagnetic Waves (3) I

Field equations, plane and spherical waves, guided waves. Pre: 350.

460 Physical Optics (3) II

Geometrical and physical optics. Pre: 264 or 274.

480 Atomic and Nuclear Physics I (3) I

Relativity, quantum theory, atomic physics. Pre: 274 or 264, 350, credit or registration in Math 403 or 402.

481 Atomic and Nuclear Physics II (3) II

Continuation of 480; nuclear physics. Pre: 480.

490 Quantum Electronics (3)

Interaction of radiation with gases and solids. Pre: 440 and Math 403 or 402.

600-601 Methods of Theoretical Physics (3-3) Yr.

Study of mathematical tools of physics, including series, transcendental functions, integral transforms, integral and differential equations, analytic function theory, elementary statistics, variational principles, tensors, group theory. Pre: Math 402 or 403-404, or consent of instructor.

605-606 Modern Physics Laboratory (1 or 2) I, II

Selected important experiments in modern physics. Measurements of nuclear magnetic resonance, Mossbauer effect, electron spin resonance, lasers, electron diffraction, and other phenomena. Pre: 275, credit or registration in 480, or consent of instructor.

610 Analytical Mechanics I (3) I

Dynamics of particles, systems of particles, and rigid bodies; Lagrangian and Hamiltonian equations; special theory of relativity. Pre: 310, Math 403-404 or concurrent enrollment in 600.

611 Analytical Mechanics II (3) II

Invariants, Hamilton-Jacobi equation. Huygen's principle, small oscillations, mechanics of elastic media. Pre: 610.

620 Physics of Upper Atmosphere (3) II

Basic parameters, experimental methods, absorption and recombination processes, intrusion of extra-terrestrial particles and fields. Pre: 310, 350, or consent of instructor. (Alt. yrs.)

621 Stellar Atmospheres I (3) I

Excitation, ionization, dissociation, and radiative transfer in stellar atmospheres. Model atmospheres. Elements of continuum and line formation. Interpretation of stellar spectra. Pre: 480, Math 403-404 or concurrent registration in 600.

622 Stellar Atmospheres II (3) II

Detailed theory of formation of spectrum lines and continuum. Pre: 621.

623 Stellar Interiors and Evolution (3) II

Equilibrium structure of stars and their evolution in time. Interpretation of observed color-luminosity and mass-luminosity relations. Nuclear reactions, radiative opacity, convection and model star calculations. Pre: Math 403-404 or concurrent enrollment in 600.

627 Galactic Structure I (3) II

Stellar statistics, stellar populations, and structure of galaxy. Pre: consent of instructor.

628 Galactic Structure II (3) I

Dynamics of star clusters, galaxies, and systems of galaxies. Dynamics of interstellar medium. Pre: 627.

629 Astronomical Techniques (3) II

Experiments in photoelectric and photographic photometry, spectroscopy, optics, infra-red techniques, stellar classifications, and positional astronomy. Practical observing experience. Pre: consent of instructor.

650 Electrodynamics I (3) II

Potential theory, Maxwell's equations, electromagnetic waves, boundary value problems. Pre: 450; Math 403-404 or concurrent enrollment in 600.

651 Electrodynamics II (3) I

Relativistic electrodynamics, radiation by charged particles. Pre: 650.

660 Advanced Optics (3) I

Wave motion, interference, diffraction, fundamentals of spectroscopy, optics from viewpoint of electromagnetic theory, lasers. Pre: 460 (Alt. yrs.)

690 Seminar (1) I, II

Discussions and reports on physical theory and recent development. Pre: graduate standing or consent of instructor.

695 Seminar on Atomic and Solid-State Physics (1)

Discussions and reports on recent development of atomic and solid-state physics. Pre: graduate standing or consent of instructor. May be repeated.

700 Seminar on Elementary Particle Physics (1) I, II

Report and discussion of recent developments in the field of elementary particle physics. Pre: consent of instructor. May be repeated for credit; maximum 4 semesters.

711 Advanced Topics in Theoretical Physics (3) I, II

Course content varies from term to term to cover topics of interest in current theoretical research. Topics may include, but are not limited to: quantum field theory (generally offered in alternate years), invariance principles in particle physics, S-matrix theory, many-body theory, superconductivity. Pre: consent of instructor. May be repeated.

724 Solar Physics (3) I

Chromospheres and coronal physics, solar activity and its manifestations, photospheric structure, analysis of solar observations. Pre: 621.

725 Planetary Physics (3) I

Physical processes and the composition of planetary interiors, surfaces, atmospheres, and environment. Pre: consent of instructor.

730 Statistical Mechanics (3) I

Probability and statistics, classical and quantum-mechanical statistical mechanics, relation to thermo-dynamical variables, applications. Pre: 430, 610, 770. (Alt. yrs.)

732 Astrophysical Spectra (3) II

Description and interpretation of spectra of such objects as: stars with extended atmospheres, planetary and gaseous nebulae, H II regions, novae. Pre: 480.

733 Special Topics in Astronomy (3) I, II

Course content reflects special interest of staff and visiting faculty, but includes detailed discussion of planetary astronomy, stellar pulsation, cosmology, interstellar medium, variable stars. Pre: consent of instructor.

770-771 Quantum Mechanics (3-3) Yr.

Physical basis and formulation of quantum theory. Exact solutions of Schrodinger equation and their applications. Approximation methods. Applications to atomic, nuclear, and molecular physics. Pre: 481, Math 403-404 or Physics 600-601.

772 Relativistic Quantum Mechanics (3) I

Relativistic wave equations and their solutions. Dirac's theory of the electron, propagator techniques. Applications to quantum electrodynamics. Pre: 771.

- 777 Nuclear Physics I (3) I**
Properties and structure of nuclei, reactions, and nuclear models. Pre: 481, 770.
- 778 Nuclear Physics II (3) II**
Elementary particles, nuclear forces, meson theory. Pre: 777 and consent of instructor.
- 780 Atomic and Molecular Spectra (3) II**
Study of atomic and molecular structure by quantum mechanical interpretation of line, band, continuous spectra. Pre: 770.
- 785 Solid-State Theory (3) I**
Quantum theory of crystalline solids. Pre: 440, 770. (Alt. yrs.)
- 799 Directed Research (arr.) I, II**
Pre: consent of instructor.
- 800 Thesis Research (arr.) I, II**

Political Science (PoISc)

Professors FRIEDMAN, KARIEL, LEVI, MELLER, MIWA, PAIGE, RIGGS, RUMMEL, STAUFFER;
Associate Professors BECKER, CAHILL, DATOR, GOLDSTEIN, HAAS, KURODA, NEFF; Assistant
Professors ALSCHULER, BWY, NITZ, ROHTER, SHAPIRO, TABB, WILSON; Visiting
Professor APPLETON; Associate Political Scientist CHADWICK

110 is a prerequisite for all other courses, except when waived by the department.

- 110 Introduction to Political Science (3) I, II** Bwy, Kariel
Introduction to political problems, systems, ideologies, processes.
- 300-301 Political Thought (3-3) I, II** Nitz, Kariel, Wilson
Consideration of major elements of political theory.
- 305 Topics in Political Thought (3)** Staff
To be pre-announced each semester. Recent topics include: Political Ideology, Revolutionary Movements and Theory, Political Extremism, Utopias.
- 320-321 International Relations (3-3) I, II** Appleton, Chadwick, Haas, Levi, Neff, Rummel
Integrated introduction to international relations and organization. (320 prerequisite for 321 unless waived by department).
- 325 Topics in International Relations (3) I, II** Appleton, Chadwick, Haas, Levi, Neff, Rummel
To be pre-announced each semester. Recent topics include: International Organization, South and Southeast Asian International Politics, U.S. Policy in Vietnam, American Foreign Policy, International Politics in East Asia, Coalition Formation and Alliance.
- 330-331 Policy Formation (3-3) I, II** Nitz, Tabb
Genesis, organization, expression, efficacy of political demands.
- 333 American Government (3) I, II** Miwa
Organization and functioning of American political system.
- 335 Topics in Policy Formation (3) I, II** Staff
To be pre-announced. Recent topics include: Public Opinion and Politics, Democratic Theory, Politics of Poverty, Personality and Politics, Community Politics.
- 340-341 Comparative Government and Politics (3-3) I, II** Alschuler, Bwy, Dator, Kuroda, Paige, Stauffer
Integrated introduction to comparative political institutions and patterns.

- 345 Topics in Comparative Government and Politics (3) I, II** Alschuler, Bwy, Dator, Kuroda, Paige, Stauffer
To be pre-announced each semester. Recent topics include: Political Leadership, Comparative Political Analysis, Japanese Politics, Latin American Politics, Political Modernization, China, Soviet Union, Comparative Communist Systems.
- 350-351 Public Administration (3-3) I, II** Friedman, Meller
Integrated introduction to public organization and management theory, administrative institutions and processes. (350 prerequisite for 351).
- 355 Topics in Public Administration (3) I, II** Staff
To be pre-announced each semester. Recent topics include: University Administration in Developing Countries, Bureaucracy, Organizational and Management Theory.
- 360-361 Public Law and Politics (3-3) I, II** Becker
Integrated introduction to interrelationship between judicial process and political system. (360 prerequisite for 361).
- 365 Topics in Public Law and Politics (3) I, II** Staff
To be pre-announced each semester. Recent topics include: Freedom and Authority, Judicial Policy-Making, Constitutional Rights.
- 990, 991 Colloquium in Political Science (3) I, II** Staff
Seminar dealing with specialized subjects in subfields of political science. (Admission by consent of instructor only.)
- 394-395 Senior Honors Thesis (4) I, II** Staff
First semester, selection of topic; second semester, completion of thesis, under direction of selected adviser.
- 600 Scope and Methods of Political Science (3) I, II** Staff
Main concepts delineating boundaries of discipline; approaches to knowledge employed by political scientists, including philosophical, legal, historical, comparative, behavioral. Anatomy of empirical and normative theory; problems in theory-building; validity and reliability in research design; role of deduction. (Required for all degree students.)
- 601 Political Analysis, Theory Building and Techniques (3) I, II** Staff
Research techniques in current use by department members, including content analysis, survey and interviewing, experimentation, etc. Students will assist in a relevant research project.
- 602 Research Practicum (3) I, II** Staff
Introduction to statistical analysis from simple bivariate through multivariate analysis.
- 610 Political Thought (3) I, II** Kariel, Wilson
Each semester a topical or chronological section on normative Western political thought; in addition, sections with geographical delimitation (as America, Asian, etc.) offered as staff conditions permit.
- 620 American Government (3) I, II** Miwa, Tabb
At least one section a semester, with focus of sections varying among national, state, local governments, and special topics.
- 630 International Relations (3) I, II** Appleton, Chadwick, Haas, Levi, Neff, Rummel
At least one section a semester, with focus of sections varying among foreign policy, international law, theoretical problems in international relations, global or regional organization.
- 631 International Relations of Asia (3) I, II** Appleton, Chadwick, Levi
At least one section a semester on international relations of all or parts of Asia.
- 640 Comparative Government and Politics (3) I, II** Alschuler, Bwy, Dator, Kuroda, Stauffer
At least one section a semester, with focus of sections varying among East Asia, Southeast Asia, South Asia, Europe, and development politics. (Frequent offerings of Asian sections scheduled.)
- 650 Public Administration Theory (3) I, II** Meller, Riggs
One section each semester, with focus of sections varying among theoretical approaches to study of administration, comparative, development administration.

- 651 Functional Aspects of Public Administration (3)** **Staff**
Sections on functional aspects of American administration (personnel and financial administration, planning, etc.).
- 660 Public Law and Judicial Systems (3)** **Becker**
At least one section a year surveying literature on interaction of judiciaries and political systems.
- 670 Politics (3)** **Cahill, Nitz, Tabb**
At least one section a year surveying literature on study of politics and political interaction.
- 699 Directed Reading and Research (arr.) I, II** **Staff**
Pre: consent of instructor.
- 710* Seminar: Political Thought (3)** **Kariel, Tabb, Nitz, Wilson**
Pre-announced topics; at least one section a year.
- 720* Seminar: American Government (3)** **Miwa, Tabb**
Pre-announced topics; at least one section a year.
- 730* Seminar: International Relations (3) I, II** **Appleton, Chadwick, Haas, Levi, Neff, Rummel**
Pre-announced problems of both international organization and politics; at least one section a semester.
- 740* Seminar: Comparative Government and Politics (3) I, II** **Alschuler, Bwy, Dator, Kuroda, Stauffer**
Pre-announced topics; at least one section a semester.
- 750* Seminar: Public Administration (3) I, II** **Meller, Riggs**
Administrative theory, comparative and development administration, and functional aspects, as pre-announced; at least one section a semester.
- 760* Seminar: Judicial Systems (3)** **Becker**
Research projects emphasizing American system or comparative analysis, as pre-announced; at least one section a year.
- 770* Seminar: Politics (3)** **Cahill, Nitz, Tabb**
Pre-announced topics; at least one section a year.
- 800* Thesis I, II** **Staff**

Psychology (Psy)

Professors ARKOFF, BITNER, CROWELL, DIAMOND, DIGMAN, STAATS, WEAVER; Associate Professors BLANCHARD, GALLIMORE, GROTH, HERMAN, LEWIT, THARP, WATSON; Assistant Professors AMES, CARLSON, MANSSON, MINKE, MOELY, P. SHAPIRO, S. SHAPIRO, TANABE

- 100 Survey of Psychology (3) I, II**
Principles of human behavior, individual differences, motivation, emotion, perception, learning.
- 110 Psychology of Adjustment (3) I, II**
Understanding and improving adjustment: Needs, frustrations, conflicts, anxiety, patterns of adjustment. Concepts of mental health. Not open to majors.
- 112 Introductory Laboratory in Psychology (3) I, II**
Introduction to the experimental method in psychology. Supervised experiments in human and animal learning and performance, with emphasis on laboratory control, data analysis, and communication of findings. Pre- or co-requisite: 100.
- 113 Statistical Techniques (3) I, II**
Frequency distributions; graphic methods, central tendency; variability; correlation; reliability; tests of significance. Pre: two years of high school algebra or equivalent. Pre: 100.

* Consent of instructor prerequisite. Seminars may be repeated for credit.

PSYCHOLOGY

214 Learning and Motivation (3) II

Major conditions influencing learning and forgetting; the role of practice, reward, motivation, drive and emotion; theoretical interpretations of learning and motivation. Pre: 100, 112.

215 Sensory Processes (3) II

Psychophysics; vision, audition, taste, smell. Pre: 100, 112.

216 Individual Differences and Measurement (3) I, II

Individual differences in personality, aptitude, intelligence; construction, validation, administration of tests; interpretation of scores. Pre: 100, 112, 113.

317 Physiological Psychology (3) I

Psychological basis of vision, audition, motivation, emotion, learning. Pre: 100, 112.

318 Animal Psychology (3) I

Animal studies in learning, perception, motivation, physiological mechanisms. Pre: 100, 112.

319 Experimental Psychology (3) II

Original experiments with emphasis upon laboratory techniques. Control of variables, apparatus design, statistics in research. Pre: 100, 112, 113.

320 Developmental Psychology (3) I, II

Emotional, mental, physical, social development from infancy to adulthood; interests and abilities at different age levels. Pre: 100.

321 Psychology of Personality (3) II

Scientific study of personality, its meaning, assessment, development, relation to cultural-social determinants. Pre: 100.

322 Social Psychology (3) I

Interpersonal relations; social attitudes; group dynamics; intergroup relations; class and cultural influences. Pre: 100.

423 History of Psychology (3) II

Background of modern psychology. Origin and development of contemporary points of view. Pre: 100, 112.

424 Abnormal Psychology (3) II

Nature and causes of psychoneuroses and psychoses; abnormalities of intelligence; psychotherapy. Pre: 100.

425 Psychological Testing (3) I

Rationale of test construction, validation, and administration; fundamentals of statistical test theory. Pre: 216.

426 Industrial Psychology (3) I

Job motivation, satisfaction, morale, leadership. Job analysis, selection, training, safety, fatigue, efficiency, human engineering. Consumer research. Pre: 100.

427 The Exceptional Child (3) II

Evaluation of physical, emotional, and intellectual deviations and their effects upon growth and development of children. Pre: 320. (Odd numbered years.)

428 Social Development of Children (3) II

Survey of the socialization process and acquisition of social behavior. Pre: 320. (Even numbered years.)

429 Advanced Undergraduate Seminar (3) I, II

Coverage in depth of some area of research and theory. Pre: consent of instructor. May be repeated.

430 Complex Human Learning (3) I

Extension of principles of learning (theory and research) to significant functional human behavior. Principles and methods of experimental psychology of learning, and findings of behavioral sciences, used to constitute a general conception of human behavior basic to various areas of study. Pre: 100.

431 Verbal Learning and Memory (3) II

Theories, models, and mechanisms of verbal learning and memory, basic variables, research procedures, design, and methodology.

- 499 Directed Reading or Research (arr.) I, II**
Pre: consent of instructor and department chairman.
- 601 Introduction to Quantitative Methods (3) I**
Introduction to quantitative methods in psychology. Review of algebraic operations. Essentials of calculus, matrix operations, set theory, computer programming.
- 602 Statistical Analysis (3) II**
Data reduction, correlation and regression, sampling theory, simple experimental designs and their analyses. Pre: 601 or equivalent.
- 603 Design and Analysis of Psychological Experiments (3) I**
Analysis of variance and other modes of assessing results of experiments. Relation of analysis to design. Pre: 602 or equivalent.
- 604 Scaling Methods (3) II**
Theory and construction of major types of scales with examples from education, psychology, sociology. Pre: 602 or equivalent. (Identical with Ed EP 729.)
- 605 Problems of Measurement and Evaluation (3) II**
Theory of measurement and evaluation; statistical and psychological analysis of tests and scales. Pre: 425 or equivalent; 601, 602. (Identical with Ed EP 709.)
- 606 Multivariate Methods (3) I**
Advanced regression analysis, factor analysis, canonical analysis, grouping methods. Pre: 602. (Alt. yrs.)
- 607 Introduction to Mathematical Models (3) II**
The logic and structure of mathematical models; their application to various areas of psychological theory. Pre: 602. (Alt. yrs.)
- 630 Experimental Method (3) I**
Research methodology in experimental psychology.
- 631 Experimental Methods in Social Psychology (3) I**
Laboratory methods in social psychology for investigation of attitude change, social perception, group performance; representative experiments. Pre: 322 or equivalent.
- 633 Comparative Psychology (3) II**
Comparative study of natural behavior, learned behavior, sensory processes, social behavior in animals.
- 634 Physiological Psychology (3) I**
Relationship of central and peripheral nervous systems to behavior.
- 635 Sensory Processes and Psychophysics (3) II**
Basic research and theories describing the sensory systems.
- 636-637 Learning and Motivation (3-3)**
Consideration of principal findings and major theories in learning and motivation.
- 638 Perception (3) II**
Historical review of major theories and research in perception.
- 640 Verbal Learning (3) I**
Basic variables, processes, and theories in field of verbal learning and memory.
- 641 Skill Learning (3) II (alternate years)**
Human learning, with special reference to information processing, attention, memory, motor involvement in performance of skilled acts.
- 643 Cognitive Processes (3) II (alternate years)**
Theory and basic experimentation in concept formation, problem solving, logical reasoning, creative thinking.
- 644 Mathematical Models (3) II (alternate years)**
Application of mathematical models to specific area in experimental psychology. Pre: 607.
- 649 Instrumentation (3) I**
Basic concepts of electricity and electronics and their application to instrumentation of psychological experiments.

PSYCHOLOGY

653 Infant Development and Behavior (3) I

Theory and research in early development.

654 Cognitive Development (3) II

Development of cognitive processes from infancy to adolescence; acquisition of complex concepts and symbolic processes.

655 Learning, Language, and Intellectual Functioning (3) II

Theory, research, and method in study of language acquisition; function of language in intellectual activities; application to cognitive behavior modification. Pre: 430. (Identical with Ed EP 655.)

656 Social Learning and Personality (3) I

Development and modification of social behavior in children.

660 Personality: Theory and Research (3) I

Methods of measurement, antecedents, structure, dynamics, situational determinants of individual reactions. Evaluation of theories and related research. Pre: 321 or equivalent.

661 Personality and Social Interaction (3) II

Theory and research on the relationship of the social situation to individual differences in such situations. Pre: 321 or equivalent.

662 Social Psychology (3) I

Theories and research in social cognition and social behavior. Pre: 322 or equivalent.

663 Behavior in Groups (3) I

Social motivation of groups, conformity and power, cooperation and competition, group structure, leadership, intergroup processes. Pre: 322 or equivalent.

664 Attitude Development and Change (3) II

Attitude measurement, attitude development, persuasion, group support of attitudes, applications. Pre: 322 or equivalent.

665 Cross-Cultural Psychology (3) I

Theories of psychology and their application to cross-cultural phenomena; assessment of cross-cultural processes and social motivation; culture and personality; evaluation and design of cross-cultural research.

666 Psychology and Social Issues (3) I (alternate years)

Conflict, dissent, community issues, problems; social change and its relation to mental disorder.

670 Applied Social Psychology (3) II

Survey of basic problems in use of social psychological principles and techniques in fields of human relations, business and industry, communication.

675-676 Behavior Assessment (2-2) Yr.

Principles and methods of assessing behavior, such as direct observation, interviewing, psychological examination. Pre: consent of instructor.

677-678 Behavior Assessment Laboratory (1-1) Yr.

Practicum experience in behavior assessment methods; must be taken concurrently with 675-676.

681 Childhood Behavior Disorders and Intervention (3) I

Disturbances in the development of child behavior, and techniques for amelioration. Pre: 675, 676.

682 Adult Behavior Disorders and Intervention (3) II

Disturbances in adult behavior, and techniques for amelioration. Pre: 675, 676.

683 Social Behavior Disorders and Intervention (3) I

Development of social problems such as crime and delinquency, substance abuse, cultural deprivation, etc., and techniques for amelioration. Pre: 675, 676.

685 Child Learning Laboratory (3) I, II

Application of learning theory and procedures to individual and group work with children in controlled studies; basic to behavior modification procedures in clinical and educational psychology. (Identical with Ed EP 685.)

687 Practicum in Behavior Change: Community Issues (3) I

Supervised experience in educational, mental health, correctional, consulting, or community action agencies. Pre: consent of instructor.

688 Practicum in Behavior Change in Children (3) I

Supervised experience in analyzing and developing methods for therapeutic change in children. Pre: consent of instructor.

689 Practicum in Behavior Change in Adults (3) II

Supervised experience in analyzing and developing methods for therapeutic change in adults. Pre: consent of instructor.

690 Practicum in Clinical Psychology (arr.) I, II

Pre: consent of instructor.

699 Directed Research (arr.) I, II

Pre: consent of instructor and department chairman.

700 Seminar (3) I, II

(1) General, (2) history and theory, (3) statistics and measurement, (4) experimental, (5) physiological, (6) personality, (7) social, (8) developmental, (9) applied-industrial, (10) clinical, (11) comparative, (12) learning, (13) perception. May be repeated.

714 Survey Research Methods (3) I, II

Field methods in social psychology; sampling, field observation, interviewing, coding methods; study of intact groups and organizations in their natural setting. Pre: 322 or equivalent. (Identical with Soc 714.)

730 Research in Experimental Psychology (3) I, II

Supervised reading, discussion, research projects in areas of special interest. Open only to second-year graduate students. May be repeated.

750 Research in Developmental Psychology (3) I, II

Supervised reading, discussion, research projects in areas of special interest. Open only to second-year graduate students. May be repeated.

760 Research in Personality (3) I, II

Supervised reading, discussion, research projects in areas of special interest. Open only to second-year graduate students. May be repeated.

762 Research in Social Psychology (3) I, II

Supervised reading, discussion, research projects in areas of special interest. Open only to second-year graduate students. May be repeated.

790 Research in Clinical Psychology (3) I, II

Supervised reading, discussion, research projects in areas of special interest. Open only to second-year graduate students. May be repeated. Pre: consent of instructor.

795 Internship in Clinical Psychology (0) I, II

Pre: consent of instructor and department chairman.

800 Thesis or Dissertation Research (arr.) I, II**Religion (Rel)**

Professor AOKI; Associate Professors BOBILIN, SEIFERT; Assistant Professors CRAWFORD, DOUGLASS, GRAY; Instructor WARNER

150 Introduction to World's Religions (3) I, II

Introduction to world's living religions—Hinduism, Buddhism, Shinto, Confucianism, Taoism, Judaism, Christianity, Islam.

151 Religion and the Meaning of Existence (3) I, II

Introduction to basic ideas and issues of contemporary religious thought as related to the question "What is the meaning of existence?"

RELIGION

- 200 Understanding the Old Testament (3) I** **Seifert**
Study of developing beliefs and practices of Hebrew religion as set forth in Old Testament. Emphasis on meaning of its faith for modern world.
- 201 Understanding the New Testament (3) II** **Seifert**
Origin and development of early Christian message as set forth in New Testament, with special attention to Jesus and Paul.
- 309 The Life and Teachings of Jesus (3) II** **Seifert**
Critical study of life and teachings of Jesus. Interpretation of meaning of Jesus Christ for Christian faith. (Not offered 1969-70.)
- 310 The Prophets and Sages of the Old Testament (3) I** **Seifert**
Prophetic and wisdom literature of Old Testament. (Not offered 1969-70.)
- 340 Western Religious Thought to 1492 (3) I** **Crawford**
Ideas of major religious thinkers and movements in western world to 1492; evaluation of Roman Catholicism. (Not offered 1969-70.)
- 341 Western Religious Thought From 1500 (3) II** **Crawford**
Period of Protestant Reformation to present, with evaluation of Protestant movement. (Not offered 1969-70.)
- 361 The Nature and Destiny of Man (3) II** **Crawford**
Religious views of human nature in their bearing on man's activities in politics, education, law, economics, literature. (Not offered 1969-70.)
- 451 Existential Interpretation of Biblical Faith (3) I** **Seifert**
Interpretation of Biblical faith on basis of critical theological thought and existential analysis with reference to visual arts and literature.
- 452 Symbology and the Problem of Good and Evil (3) I** **Gray**
Investigation of the comparative symbols and myths used in the primitive and major religious traditions to cope with the continuing problem of forces outside of personal control.
- 471 Christian Thought in Contemporary Asia (3) I** **Seifert**
Study of Asian contributions in field of Christian theology, with special emphasis on Indian and Japanese Christian thinkers. (Not offered 1969-70.)
- 480 Russian Religion (3) I** **Klimenko**
Historical background of Orthodox Christianity in Russia from the beginnings of the 9th century and following up to the 19th century and its impact on people and culture. (For information on the Russian Area Studies Certificate see p. 64.)
- 481 Russian Religion (3) II** **Klimenko**
Russian State Church, rational and mystical sects from the 19th century through the Communist Revolution up to the present. Marxism and religion. (For information on the Russian Area Studies Certificate see page 64.)
- 482-483 The History of Living Religions (3-3) Yr.** **Bobilin**
482: Basic beliefs and practices of Hinduism, Confucianism, Taoism, Buddhism, Shinto 483: Judaism, Roman Catholicism, Protestantism, their history, beliefs, contributions. Semesters independent.
- 484 Religion and Social Change in Asia (3) II** **Bobilin**
Study of interrelationship of society and religion in Asia. Emphasis on roles of traditional elites, heterodox religious movements, effects of modernization, secularization and religious organization, socio-religious movements in developing countries.
- 485 Ethics in Asian Religions (3) II** **Crawford**
Comparative analysis of ethical thought and practice in cultures and of persons shaped by the major religions of Asia.
- 486 Christian Ethics and Social Programs (3) I** **Crawford**
Basic systems and methods of Christian ethics emphasizing differing thought on major social issues; analyzing significant factors affecting (differing) thinkers; indicating relevance of Christian thought to contemporary social problems.

488 Theology of Peace (3) I, II

Study of the nature of peace, revolution, war violence and non-violence, as revealed especially in contemporary history, from theological perspective.

602 Religious and Social Thought of Mohandas Gandhi (3) I or II

Study of the life and teaching of Gandhi, with special emphasis on his religious beliefs and his social and political ethics.

630 History and Theory of the Study of Religion (3) I

Bobilin

Focus on significant events, phenomena and ideas in the history and practices of religions. Insights and methodologies of scholars from anthropology, history, philosophy, political science, psychology, and sociology will be related to the history and practice of religions.

640 Religious Values and the Public Service (3) II

Gray

Consideration through case studies of various types of ethical decisions which individuals working for governmental or voluntary organizations must make at every level.

651 Selected Problems of Theology (3) I, II

Staff

Pre: graduate standing, consent of instructor.

660 Contemporary Religious Thought (3) II

Seifert

Intensive study of a significant man or issue in contemporary religious thought; e.g., Bonhoeffer, Radakrishnan, Nishida, Buber, Tillich; non-theistic theology, theology of revolution, theology of hope.

685 Studies in Japanese Religion (3) I or II

Bobilin

Advanced study of one of the religions of Japan. (Not offered 1969-70.)

Social Sciences (SocSc)

Professor MATSON; INSTRUCTORS KINGHORN, FERDON

301-302 Man In Society (3-3) Yr.

Matson, Kinghorn, Ferdon

Some basic problems and processes of contemporary society, jointly examined by the several social sciences. Pre: sophomore standing or consent of instructor. (Cross-listed as American Studies 301-302.)

Sociology (Soc)

Professors BALL, BLOOMBAUM, C. K. CHENG, FREEMAN, GLICK, HORMANN, KASSEBAUM, YAMAMURA; Associate Professors BARRINGER, CHO, KRAUSS, SAKUMOTO, WITTERMANS, WON; Assistant Professors BABBIE, BRODIE, CHANDLER, R. CHENG, KATZ, STEAHR, STEINHOFF, SWIFT, TURNER, VAN ZEYLL, WEGNER, WEINSTEIN, YAMAMOTO

151 and 201 are equivalent introductory courses. 201 is specifically set up for juniors, seniors, or graduate students. Either course is a prerequisite to all advanced courses.

151 Introduction to the Study of Society (3) I, II

Chandler, Katz, Steahr, Swift, Turner

Basic social relationships, norms, social structures, processes affecting social change. Not open to juniors or seniors.

201 Principles of Sociology (3) I, II

R. Cheng, Steinhoff, Swift

Principles underlying organization of social groups, communities, institutions, ecological structures; basic processes of socialization, collective behavior, social change. Equivalent to 151; open only to juniors, seniors, graduates.

305 Human Ecology (3) I

Yamamura

Basic concepts, principles, and techniques. Factors affecting distribution of population, utilities, social institutions.

SOCIOLOGY

- 310 Community Forces in Hawaii (3) I, II** **Hormann**
Basic factors and forces in contemporary society as exemplified in Hawaii.
- 320 Race Relations (3) I, II** **Glick, Katz**
Race relations in world perspective; typical situations; conflict and accommodation; caste; race prejudice; miscegenation; effects upon personality.
- 325 Social Institutions (3) II** **Barringer, Wittermans**
Culture as conceptual tool. Origin, structure, function, growth of institutions. Interrelation and integration.
- 340 Social Control (3) I, II** **Wittermans**
Analysis of processes by which individuals become amenable to social and mass definitions of conduct and behavior.
- 350 Social Disorganization (3) II** **Hormann, Kassebaum**
Factors in community, institution, group disorganization; behavioral deviancy and social pathology. Integrated approach to social problems.
- 355 Criminology (3) I, II** **Cheng, Kassebaum**
Crimes and criminals; causative theories of criminality; institutional problems of apprehension, prosecution, incarceration, correction, rehabilitation.
- 360 Personality and Culture (3) I, II** **Bloombaum, Wegner**
Origin and development of personality as subjective aspect of culture; function of communication; human nature and the mores; personal life organization.
- 370 Social Change (3) I, II** **Wittermans**
Structural-functional organization. Impact of technology on institutions, value orientation, power structures, systems of roles and stratification.
- 399 Directed Reading (arr.) I, II**
Limited to senior majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in sociology.
- 410 Population and Society (3) II** **Cho, Steahr, Yamamura**
Society analyzed in terms of quantitative and qualitative aspects of population. Sociological aspects of birth and death rates, natural increase, mobility.
- 415 The Agrarian Community (3) I** **Hormann**
Community types as affected by transition from subsistence to commercial and industrial agriculture.
- 416 The Urban Community (3) II** **Krauss, Sakumoto**
Sociological principles as applied to modern city. Structure, growth, social and personal life organization.
- 425 People and Institutions of China (3) I, II** **Cheng**
Analysis of social philosophies, their influence on basic institutions and traits of people. Impact of Western civilization and communism. Social change under People's Democratic Dictatorship.
- 426 People and Institutions of Japan (3) I, II** **Steinhoff, Yamamoto**
Social structure and social change in contemporary Japan. Special attention to family, stratification, mobility.
- 427 People and Institutions of Korea (3) I, II** **Barringer**
Social institutions and change processes in contemporary Korea. The family, education, polity, economy, religion. Comparison of North and South Korea.
- 430 Race Relations in the Pacific (3) I, II** **Glick**
Dominant conceptions of race and race relations, and factors affecting them; race and culture contacts in Hawaii and other Pacific areas.
- 441 The Family (3) I, II** **Chandler, Cheng, Yamamura**
Culturally distinctive family types as background for analysis and interpretation of the American family.
- 443 Sociology of Religion (3) I** **Hormann, Wittermans**
Structure, function, dynamics of religion in various types of society.

- 445 Sociology of Education (3) I, II** Swift, Weinstein
 Institutionalization of socialization and allocation processes. Transmission of cultural styles and values; social organization of classrooms, schools, school systems and their intersection with other social institutions; careers of students and teachers.
- 447 Industrial Sociology (3) I, II** Won
 Status system in industry. Problems of group adjustment. Factors affecting industrial morale. Sociology of industrial conflict.
- 449 Social Stratification (3) II** Krauss, van Zeyl
 Analysis of social class; local and national stratification patterns; social mobility in industrial and non-industrial societies.
- 455 Juvenile Delinquency (3) I, II** Ball, Sakumoto
 Nature and extent of juvenile delinquency; theories and research; sociology of correction.
- 465 Sociology of Small Groups (3) I** Bloombaum, Weinstein
 Practical application of theories and research findings involving face-to-face relations; leadership, prestige, group morale.
- 470 Collective Behavior and Social Movements (3) I, II** R. Cheng, Glick
 Elementary forms of collective behavior; crowds, publics, mass behavior; social movements, their development and relation to social change.
- 481 Methods of Social Research (3) I, II** Bloombaum, Brodie
 Values and limitations of methods of research for various types of studies. Pre: 9 credits in sociology or consent of instructor.
- 485 Social Statistics (3) I, II** Freeman, Sakumoto, Yamamura
 Introduction to statistical methods and resources as applied to social research data.
- 491 Sociological Theory (3) II** Ball, Sakumoto
 History of sociology as reflected in writings from early Greek thought to modern authors such as Durkheim. Pareto, Simmel, Parsons, Merton.
- 493-494 Honors Thesis (2-2) Yr.**
- 610 Methods and Statistics I (3) I**
 Logic of social research; principles of conceptualization, formal design, observation. Pre: 485 or equivalent.
- 611 Methods and Statistics II (3) II**
 Logic of social research; statistical treatment of social data. Pre: 610.
- 612 Classics of Sociological Theory (3) I**
 Study in depth of selected works by early sociologists such as Emile Durkheim and Max Weber. Influence of such works upon modern sociology. Pre: consent of instructor.
- 613 Concepts and Propositions in Sociology (3) II**
 Survey of major propositions in modern sociology. Sociological concepts such as primary group, social role, social class related to these propositions; their place in sociological theory and research. Pre: consent of instructor.
- 714 Seminar in Methods of Research (3) I, II**
 Individual or group projects providing training in (1) the design of social research, (2) field techniques, (3) survey research design, (4) survey data analysis (5) problems in comparative research. Pre: consent of instructor.
- 715 Seminar in Social Statistics (3) I, II**
 Advanced statistical procedures; may include individual projects. (1) Measurement of social variables, (2) data analysis. Pre: consent of instructor.
- 716 Seminar in Theory Construction (3) II**
 Application to sociology of logical or mathematical deductive systems. Nature of such systems and their application to sociology. (1) Logical models, (2) mathematical models. Pre: consent of instructor.
- 720 Seminar in Social Organization (3) I, II**
 Structural elements of human group life. (1) Industrial sociology, (2) social stratification, (3) social control. Pre: consent of instructor.

SPEECH-COMMUNICATION

721 Seminar in Social Institutions (3) I, II

Structure, function, growth of social institutions. (1) Sociology of law, (2) sociology of religion, (3) the family, (4) political sociology, (5) Chinese society, (6) Japanese society, (7) sociology of education, (8) comparative social institutions. Pre: consent of instructor.

722 Seminar in Group Relations (3) I, II

Major theoretical developments and research problems in fields of race relations and minority relations. (1) Race relations, (2) minority relations. Pre: consent of instructor.

730 Seminar in Social Disorganization (3) I, II

Theory and research in social disorganization; institutionalization of criminals and juvenile delinquents. (1) Deviant behavior, (2) juvenile delinquency and criminal behavior, (3) penology. Pre: consent of instructor.

731 Seminar in Social Change (3) I, II

Principles, processes, problems of social change. Emphasis on non-Western societies undergoing industrialization. (1) Social change in developing areas, (2) social movements, (3) community development. Pre: consent of instructor.

740 Seminar in Social Psychology (3) I, II

Individual behavior in social contexts; may include individual projects. (1) Social interaction, (2) socialization, (3) social conflict. Pre: consent of instructor.

741 Seminar in Culture and Communication (3) I

Theories of communication; interaction between oral traditions, the press and audiovisual mass media in cultural context. Pre: consent of instructor.

750 Seminar in Demography and Human Ecology (3) I, II

Principles and techniques in population analysis; factors affecting distribution of population, public utilities, social institutions. (1) Demography, (2) human ecology. Pre: consent of instructor.

751 Seminar in Urban and Rural Sociology (3) I, II

Structure and dynamics of major types of human communities; effects on social and personal life organization. (1) Urban, (2) rural. Pre: consent of instructor.

799 Directed Research (arr.) I, II

Pre: graduate standing; consent of instructor.

800 Thesis Research (arr.) I, II

Speech-Communication (Sp)

Professors BILSBORROW, DYKSTRA, ELLINGSWORTH, RIDER; Associate Professors BRENNEMAN, BYERS, HARMS, HEINBERG, KLOPF, WONG; Assistant Professors EKROTH, HERVEY, LARSON, MEESKE, OWEN, OXFORD, SITARAM, WELDEN; Instructors DAME, FERGUSON, KUNIMOTO, YAMADA; Assistant Professors OGAWA, STEINBERG

101 Speech-Communication Processes (3) I, II

Introduction to study of speech-communication through models of the process. Examination of major variables of source, message, medium, receiver and how their interaction affects speech-communication. Core requirement for majors in speech and education in lieu of 145. Pre: Speech Communication Center clearance.

145 Interpersonal Speech-Communication (3) I, II

Introduction to speech-communication theory through participation in interpersonal communication activities. Weekly lectures. Concurrent Speech Communication Center clearance.

202 Media Utilization and Management (3) I, II

Examination of human nervous system and its relationship to information media. Study of ways in which sender and receiver influence utilization and management of particular media. Pre: 101.

203 Message Development (3) I, II

Theory and practice in development of speech-communication messages. Consideration of what can be known, how it can be known, how it can be expressed, and how communication purpose acts as criterion for selecting, evaluating, arranging statements. Pre: 101; 202 recommended.

211 General Phonology (3) I, II

Dynamic phonology of American English. Systematic goal-oriented study of dialects in use. Modification of speech for particular purposes including pedagogy. Pre: ability to transcribe International Phonetic Alphabet according to established standard; or consent of instructor.

221 Speech-Communication in the Management of Learning (3) I, II

Overview of principles of speech-communication management: message composition, media utilization and evaluation of speech-communication events, with special reference to problems of teaching-learning. Part of pre-service or in-service preparation of teachers; not intended for majors in speech-communication. Pre: 101 or 145.

231 Reading Aloud (3) I, II

Principles of interpretative reading. Practice in textual analysis and in transmitting intellectual and aesthetic content of literature. Pre: 101 or 145.

251 Public Speaking (3) I, II

Adaptation of rhetorical theory to particular speakers, audiences, occasions. Extensive practice in planning and delivering speeches. Pre: 101 or 145.

253 Argumentation and Debate (3) I

Adapting ideas about communication theory to structuring of argumentative strategies for social action. Extensive practice in formal argument. Pre: 101 or 145.

261 Broadcasting (3) I

Analysis and survey of radio and television as communications media and as industries.

262 Radio-TV Speech-Communication (3) I, II

Preparation and performance of radio-television program material. Emphasis on microphone and camera techniques. Suitable for the non-specialist.

263 Broadcast Laboratory (3) I

Intensive introduction to equipment and operation of radio and television studios, and the roles of members of the production team. Basic production techniques.

304 Speech-Communication Characteristics of the Source (3) I, II

Acoustical, anatomical, physiological and psychological relationships involved in processes of communication between source-receivers. Pre: 101 or 145; ability to meet established standards for transcribing IPA or consent of instructor.

305 Language in Speech-Communication Behavior (3) I, II

Effects on communication process attributable to language forms and meanings. Pre: 202, 203, or concurrent registration.

333 Storytelling (3) I, II

Esthetic communication through storytelling for entertainment and education. Oral tradition; analysis of story types; techniques of preparation and presentation; performance.

352 Group Speech-Communication (3) II

Study of discussion within context of small group. Effects of variables such as group organization, leadership, membership, goals on how group attempts to achieve its purpose. Pre: 101 or 145.

364 Broadcast Production (3) II

The theory in practice of planning, producing, and directing programs for radio and television.

365 Development and Writing of Broadcast Messages (3) I

Theory and practice in the design and writing of broadcast messages. Emphasis is placed on the purpose of the message, available alternatives, and the form and style. (Alt. yrs.)

SPEECH-COMMUNICATION

366 Strategies and Methods in Broadcast News (3) II

Comparative study of print and the broadcast media as purveyors of news; the strategies and techniques available to the broadcaster in the selection, editing, and presentation of news.

367 Strategies in Management of Broadcast Stations, (3) I

Detailed study of the functions, duties, and problems of the management team of broadcast stations and the strategies available to them in solving problems. (Alt. yrs.)

406 Evaluation of Speech-Communication (3) I, II

Development of skill in evaluation of appropriate variety of speech-communication activities. Pre: 101 and at least three of 202, 203, 304, 305, or consent of instructor.

412 Phonetics and Phonemics of American English (3) I, II

Major transcription systems of American English sounds. Application of English phonology to problems of acceptable pronunciation in English language learners. Role of teacher in developing materials and techniques based on phonetic and phonemic analysis. Pre: 211 or Ling 202 or Ling 620.

434 Advanced Interpretative Reading (3) I, II

Problems in selected literary forms; development and arrangement of programs; introduction to group interpretation; individual and group reports and performances. Pre: 231, Eng 252, or consent of instructor.

454 Strategies of Extended Speech-Communication (3) I

Investigation of the public speaker's role in planning and carrying out programs of social action.

468 Broadcasting and the Public (3) I

Relationship and interaction between broadcasting agent, government regulatory agencies, and public. Development of bases for critical evaluation of educational, cultural, and economic significance and impact of broadcasting.

469 World Broadcasting (3) II

Comparative analysis of broadcasting systems in the world and radio and television communication between countries and cultures.

491 Semantics (3) I, II

Understanding language; verbal meaning and implication; roles of perception and assumption (inference and judgment) in human relationships.

499 Special Problems (arr.) I, II

(1) Speech-communication behavior; (2) teacher preparation; (3) oral interpretation; (4) public address; (5) broadcasting; (6) microsystems; (7) macrosystems. Pre: consent of instructor or department chairman.

601 History of Theory and Trends in Speech-Communication Research (3) I

Examination of major theories and hypotheses about speech-communication which have accompanied trends in research. Study of current research methods and their application to contemporary problems. Pre: 406 or consent of instructor.

602 Methods of Scientific Research in Speech-Communication Systems (3) II

Study of methods of scientific research. Development of competence in fundamental skills necessary for completion of a thesis. Pre: 601 and one of the following—671, 672, 681, or 682.

613 Experimentation in Language Acquisition and Modification (3) I, II

Problems in language acquisition and modification. Use of equipment designed to aid language acquisition. Creation of language-learning materials. Innovation of special techniques for different language-learning situations. Pre: 305, 406, or 602 or equivalents.

631 Seminar in Interpretation (3) I

Current literature in interpretation; reports; lecture-recitals. Pre: consent of instructor.

651 Seminar in Rhetoric and Public Address (3) II

Review of rhetoric and public address. Pre: consent of instructor.

671 Speech-Communication in Control of Cognition (3) I

Research and research techniques in the facilitation via speech-communication of the learning and accessing of various types of meaningful verbal information. Pre: 305, 406 or equivalents.

672 Speech-Communication in the Control of Behavior (3) II

Research and research techniques in the use of speech-communication to shape psychomotor skills and relevant attitudes. Pre: 671.

681 Speech-Communication Process Analysis (3) II

Description of the problems involved in analyzing various aspects of the speech communication process. Theoretical frameworks of analysis. Pre: permission of instructor.

682 Speech-Communication: Theories of Source-Receiver Behavior (3) II

Description and analysis of some major behavioral science theories which describe and predict the behaviors of sources and receivers in communicating. Pre: permission of instructor.

696 General Seminar (3) I, II

Seminar on selected topics in speech-communication. May be repeated with permission of department chairman. Pre: consent of instructor and department chairman.

784 Seminar in Intercultural Speech-Communication (3) I

Focus on the major variables of speech-communication in an intercultural context. Linguistic and non-verbal factors. Possibilities for training in intercultural, face-to-face communication roles. Pre: 101 and at least one course in cultural anthropology, or permission of instructor.

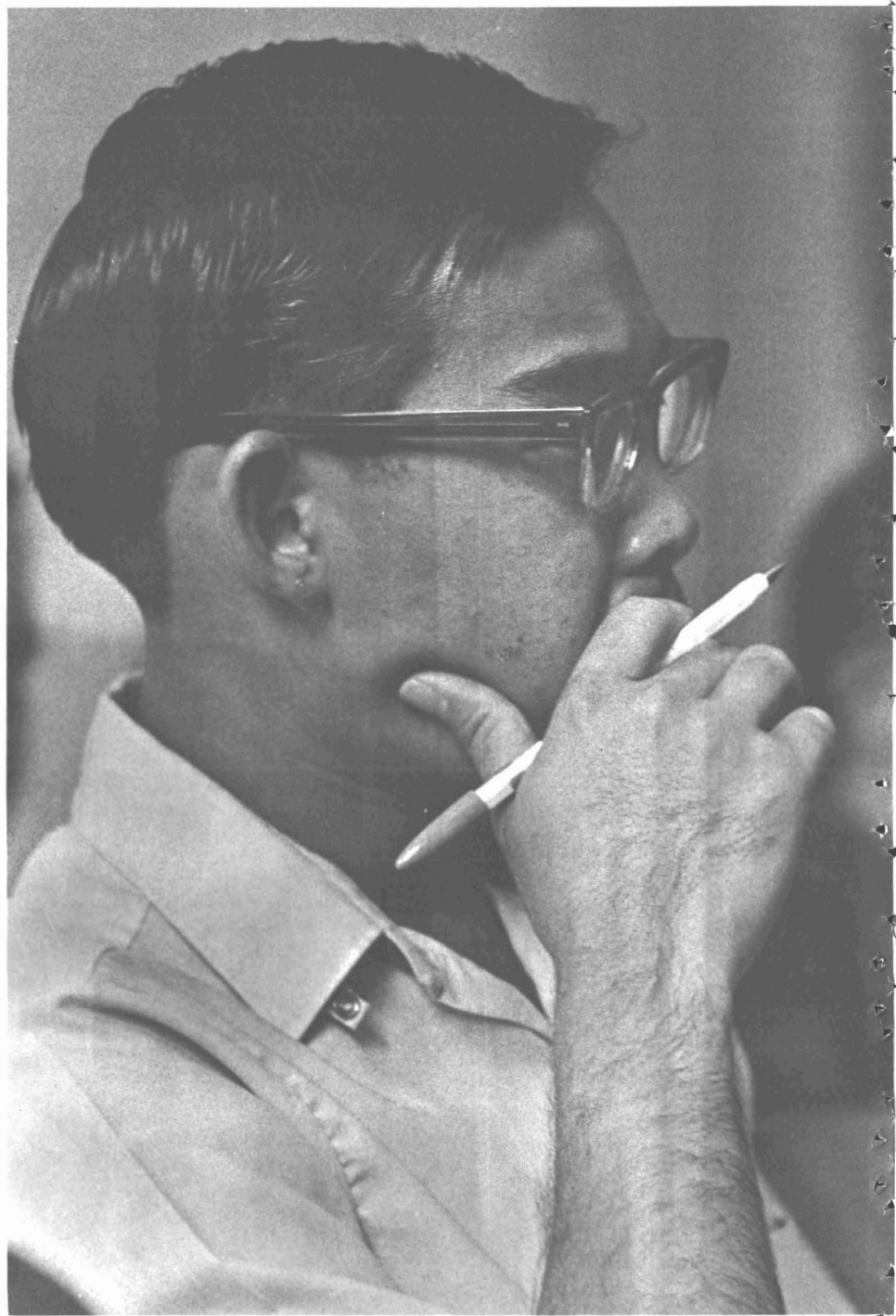
785 Seminar in Speech-Communication in Innovation (3) II

Role of speech and other forms of communication in facilitating the adoption of new ideas and practices. Analysis of client systems and their relation to the agent of change. Development of criteria for measuring change. Pre: permission of instructor.

799 Research (arr.) I, II

See instructions under 499.

800 Thesis (arr.) I, II



College of Business Administration

THE COLLEGE OF BUSINESS ADMINISTRATION was founded in 1949 and accredited by the American Association of College Schools of Business in 1967. The function of the College is to prepare students for business leadership in Hawaii and the Pacific area. Students are provided with a solid foundation, both theoretical and practical, in the structures, functions and objectives of business enterprise. The four-year program leads to the Bachelor of Business Administration degree.

As part of the Business Administration program, the student will complete a broad foundation of courses in liberal arts, humanities, and physical and social sciences which serves as a base for an economics minor, a core of basic business subjects, and a specialized field of business activity selected by the individual student.

Juniors and seniors in the College of Business Administration will complete additional general requirements. Each student will select one of the following specializations: accounting, finance, business economics and statistics, foreign trade, insurance, management, marketing, personnel and industrial relations, and real estate. The School of Travel Industry Management offers a special program; students entering the University as freshmen should indicate their wish to enter this program.

Academic advising and career counseling in business are available in the College to all students interested in these services. This includes students presently enrolled in the College and students in other colleges. All faculty members are available for career counseling during office hours or by appointment. Academic advising and career counseling are available in the office of the assistant dean of the College except for students in the School of Travel Industry Management, who receive these services in the office of the associate dean of the School of TIM.

Admission and Degree Requirements

Students may enter the College of Business Administration as freshmen in accordance with the University of Hawaii requirements or may transfer into the College of Business Administration at any time in their college career from another college in the University of Hawaii, or as transfer students from another institution if they have a 2.0 grade-point average.

General Education Requirements	CREDITS
Communications	6
Quantitative Reasoning (Math 134)	4
World Civilizations	6
Humanities (including one course in literature)	9
Natural Sciences	10-12
Social Sciences (Econ 150 is required, and Geog 102 for TIM majors)	9
	<hr/>
	44-46

Pre-Business Requirements

Economics 150 (<i>see above</i>)	
Accounting 201, 202 (sophomore standing)	6
BAS 111	3
	<hr/>
	9
	<hr/>
	53-55

Additional Requirements for Pre-Business Students in Travel Industry Management

TIM 101	3
FSA 181	3
TIM 100-200	0-0
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	6

In order to qualify for a degree a student must:

1. Meet all pre-admission requirements to the College;
2. complete one of the ten curricula of the College;
3. complete the University curricular requirements (*see pp. 53-56*);
4. earn an aggregate of at least 124 semester hours of credit;*
5. earn a minimum of a 2.0 grade-point average for (a) all registered credits, (b) all required upper-division CBA courses (including the major field), and (c) the major field (*see "Degree Programs"*).

* Applies to students entering the College after June 1, 1966.

†Travel Industry Management is an exception; see requirements listed under majors.

Curricula

All students must complete the following:†

- Group I. Economics (9 credit hours): Business Economics 303, 341, 342.
- Group II. Business Core (24 credit hours): Business Analysis and Statistics 301-302; Finance 300; Law 300; Management 300, 345; Marketing 300; and Personnel and Industrial Relations 300.
- Group III. A major of 15 credit hours (18 for Accounting). *See below.*
- Group IV. English 209, and 15 credit hours of upper division courses, at least 9 of which must be outside of the College of Business Administration.

Majors

ACCOUNTING. Required: Acc 305, 307. Electives: four of Acc 321, 323, 325, 331, 335, 341, 361, 365, 437, 445; BAS 321. Students desiring to concentrate in management accounting should select from Acc 341, 361, 365, 445, and BAS 321. Those desiring to concentrate in financial accounting should select from Acc 321, 323, 325, 331, 335, 437.

FINANCE. Required: Fin 305. Electives: three of Fin 307, 311, 313, 321, 390, and any upper-division business administration course with special consideration given to Acc 307, 341, BEc 361, 362, RE 321.

BUSINESS ECONOMICS AND STATISTICS. Required: BAS 320. Electives: four of BAS 311, 313, 322, 396, BEc 305, 351, 355, 361, 362, 375, Trans 351, 352.

FOREIGN TRADE. Required: BEc 361, 362; Mkt 315, 381. Elective: one upper-division business administration course.

MANAGEMENT. Required: Mgt 321, 322, 341. Electives: two of Acc 361, BAS 321, BEc 375, Mgt 344, Mkt 321, PIR 351, 361.

MARKETING. Required: Mkt 315, 321, 391. Electives: two of Mkt 331, 341, 361, 381.

PERSONNEL AND INDUSTRIAL RELATIONS. Required: PIR 351, 361. Electives: three of PIR 353, 363, 365, 367, Mgt 341.

REAL ESTATE. Required: RE 300, 310, 330, 341. Elective: one of Acc 325, RE 321, 350.

SCHOOL OF TRAVEL INDUSTRY MANAGEMENT

Created in 1967, the School of Travel Industry Management in the College of Business Administration of the University of Hawaii is unique throughout the entire world. Administratively, the specific requirements for a student who wishes to graduate from the School of Travel Industry

Management are: (a) Internship—direct paid-work experience each year for four years (200 hours each, or a total of 800 hours) to orient the student to a succession of increasingly sophisticated exposures that will make the more theoretical approaches of the classroom take on greater relevance; (b) the general University requirements plus the lower-division business requirements; (c) the College of Business core requirements—Group I, Group II; (d) Group III courses are the special major requirements for TIM—a student may elect Emphasis A (Tourism) or Emphasis B (Hotel & Restaurant Management) as his field of concentration; (e) upper-division courses in Group IV—English 309 plus 9 hours of courses which must be outside the College of Business Administration.

Total minimum credit hours to meet graduation requirements in the TIM Program are:

General Education Requirements	45-46
Pre-Business Requirements	9
Pre-Business TIM Requirements	6
College of Business Requirements	45
TIM Major Requirements (including Internship—2 credits)	23
	<hr/> 128-129

The School of Travel Industry Management curriculum offering an emphasis in Tourism or Hotel and Restaurant Management is constructed in such a manner that students selecting either option will have some exposure to the other. The nature of the world-wide travel industry is such that some knowledge of all areas is mandatory, although the TIM programs provide opportunities for special attention to each field as consistent with the student's professional interests.

EMPHASIS A - TOURISM ADMINISTRATION			EMPHASIS B - HOTEL & RESTAURANT MANAGEMENT		
TIM 321	Tourism Prin I	3	TIM 314	Institutional	
TIM 322	Tourism Prin II	3		Purchasing	3
TIM 323	Travel Agency		TIM 331	Hotel Design,	
	Management	3		Eng., Maint.	3
TRANS 351	Economics of		TIM 334	Hospitality Merch. &	
	Transportation	3		Club Mgmt.	3
TRANS 352	Passenger		TIM 351	Hotel Internal	
	Transportation	3		Controls	3
TIM 361	Law & Regulation		TIM 361	Law & Regulation	
	of Trav. Ind.	3		of Travel Ind.	3
RE 351	Resort Area		TIM 321 or TIM 323, or TRANS 351		3
	Development	3	RE 351	Resort Area	
TIM 300, 400	Internship	2		Development	3
			TIM 300, 400	Internship	2
		<hr/> 23			<hr/> 23

BUSINESS ADMINISTRATION COURSES

See pp. 4-5 for a discussion of course descriptions.

Senior Professor ROBERTS; Professors ADLER, ASCHER, BAILEY, BAIRD, BARNET, BUCHELE, CORBIN, FARRIS, FERGUSON, GEE, GILSON, GRAYSON, HOOK, IGE, JACOBSEN, LOWE, MICCIO, OMPS, PENDLETON, RICHMAN, SPENCER, WHITEHILL; Associate Professors FAISON, HOPKINS, LEE, SEO; Assistant Professors BELL, BESS, BONBRIGHT, BURY, CHUNG, CONGDON, COX, CURRIE, EL-RAMLY, FREITAS, IYENGAR, JACOBS, JONISH, KIM, KIRKPATRICK, MARSH, NOREM, PETERSON, PICKETT, SHIN, STELLMACHER, TRINE, VLACHOS, WILLIAMS; Instructor McARDLE; Lecturers BENFELL, BOYNE, HODGES, HOLZ, HALVORSEN, KVIDERA, LEONG, LUCAS, MAR, MIYOI, NAGY, SEIXAS, TOOTHMAN, WOO

DEPARTMENT OF ACCOUNTING AND FINANCE

Accounting (Acc)

201-202 Elementary Accounting (3-3) Yr.

Theory and practice of income determination and asset valuation. Preparation and analysis of statements; uses for decision making. Pre: sophomore standing.

305 Cost Accounting (3)

Cost determination and analysis as a tool of management in such areas as pricing and make, rent or buy decisions. Includes job order, process, direct and standard costs. Pre: 202, BAS 111.

307 Income Tax Problems (3)

Study of accounting problems related to income taxation, with emphasis on income, exclusions from income, deductions, and credits in the determination of income tax liability and the preparation of income tax returns. Pre: 202.

321 Financial Accounting I (3)

The accounting process, and the application of generally accepted accounting principles to accounting for cash, receivables, inventories, plant and equipment and current liabilities. Pre: 202.

323 Financial Accounting II (3)

Accounting for corporate equities, long-term debt, investments, funds flow, analysis of financial statements, and partnerships. Pre: 321.

325 Financial Accounting III (3)

Venture accounting, consignments, installment sales, insurance, branch accounting, consolidated statements, estates and trusts, statement of affairs, and foreign exchange. Pre: 323.

331 Auditing (3)

Principles of conduct of a business audit. Practical aspects of auditing emphasized by problems. Pre: 202 and 305.

335 Governmental Accounting (3)

Accounting classification, budgetary procedure, fund accounting, revenues, operating costs. Pre: 202.

341 Accounting Systems and Procedures Analysis (3)

Examination of accounting subsystems and the role of computers in the accounting process. Pre: 202. BAS 315 recommended.

361 Accounting for Managerial Planning (3)

Profit planning, budgeting, programming budgetary systems, projecting flows of funds, strategic and long-range planning. Pre: 305.

365 Enterprise Analysis and Reporting (3)

Analysis and interpretation of alternative valuation, income determination, and financial reporting policies in various industries and under varying economic conditions. Pre: 202. Not open to students who have taken 321–323.

437 Advanced Tax Problems (3)

Emphasis on advanced aspects of accounting and tax problems as related to individuals, partnerships, estates, trusts, and corporations; a study of estate and gift taxation also included. Pre: 307.

445 Advanced Cost Accounting (3)

Application of costs and other control techniques to complex managerial costs and problems dealing with performance evaluation, intra-company transfer pricing, return on invested capital, internal profit measurement. Pre: 305.

Finance (Fin)

300 Business Finance (3)

Introduction to functions, techniques, and problems of business finance; investing in assets, financing strategies, planning and control. Course will be both normative and descriptive. Pre: Acc 201–202 and BAS 111.

305 Problems in Business Financial Management (3)

Topics include working capital management, evaluation of capital expenditures, financial control and capital structure. Emphasis on widely used business practices along with critical evaluation. Case problems will be used. Pre: 300.

307 Quantitative Financial Decision Making (3)

Topics include programming investment expenditures under capital constraints, credit selection via discriminant analysis, statistical models for planning optimum dividend-retention policy. Emphasis on both the conceptual and the operational. Pre: BAS 301–302 or permission of instructor and Fin 300.

311 Investments (3)

Mechanics of investment banking and markets, corporate and government securities, selection and security analysis, risk programming and establishment of investment policy for individuals and institutions. Pre: 300.

315 Security Analysis and Portfolio Management (3)

Familiarizes the student with recent advances in econometric security valuation models, portfolio selection and techniques, methods of appraising portfolio performance. Discussion will concentrate on both theory and application. Pre: BAS 301–302 or permission of instructor and Fin 300.

321 International Business Finance (3)

Financial management of foreign and international business operations: the regulatory environment of international finance, financing international transactions, international capital markets, taxation. Emphasis will be on financial decision-making in the firm. Pre: 300.

390 Seminar in Finance (3)

Advanced topics both of a theoretical and an empirical nature in the areas of finance, investments, and the capital markets. Topics will vary from semester to semester. Course is designed to prepare the student for independent research. Pre: permission of instructor.

Insurance (Ins)

300 Principles of Insurance (3) I, II

What insurance buyers should know about protecting income against illness or premature death; protection of home and business against property losses; third-party liability.

311 Property Insurance (3) I

Protection against loss of personal and business property and income occasioned by fire and allied perils, crime, transportation risks.

321 Casualty Insurance (3) II

Emphasis on third-party liability coverages: general liability, automobile insurance, workmen's compensation.

331 Life Insurance (3) II

Policy forms; calculation of premiums, reserves, non-forfeiture values; underwriting; regulation of policy provision; related coverages.

Law (Law)

300 Principles of Business Law (3) I, II

American system of jurisprudence, elements of torts, criminal law, property trusts and estates, law of contracts and agency.

311 Intermediate Business Law (3) I, II

Law of business organizations, with emphasis on partnerships and corporations and law of sales, bailments and negotiable instruments; provisions of Uniform Negotiable Instrument Law and Uniform Commercial Code. Pre: 300.

DEPARTMENT OF MANAGEMENT, MARKETING AND INDUSTRIAL RELATIONS

Management (Mgt)

Bas 300 The World of Business and the World of Man (3)

Study of basic economic, social, and political concepts of business and industry in the world of societies of today and tomorrow. Pre: junior standing, non-business majors only.

300 Principles of Management (3)

Basic management functions of planning, controlling, organizing, staffing, directing; emphasis on human factors and quantitative analysis in developing management philosophy. Critical evaluation of current practices in business firms.

321 Operations Management I (3)

Planning effective office and manufacturing operations: historical development, human factors, methods analysis, work measurement, location layout, machine and equipment, records management. Pre: BAS 111, 302.

322 Operations Management II (3)

Control techniques for office and manufacturing operations: inventory and production planning and control, inspection and statistical quality control, computers and automation. Pre: 321.

341 Human Factors in Management (3)

Human relations in business; contributions of sociology and psychology to management process and to understanding of individual behavior in organizations.

344 Seminar in Management (3)

In-depth analysis of selected current practices and trends in administration. Pre: 300, 341; senior standing; consent of instructor.

345 Business Policy (3)

Case studies in assessing alternative risks in solving policy problems; an interdisciplinary approach applying and integrating many subjects in college curriculum. Pre: 2nd semester senior standing.

Marketing (Mkt)

300 Principles of Marketing (3)

Fundamental concepts and problems of marketing within present economic, legal and social environments; consumer analysis, functional analysis, marketing institutions. Prerequisite to all other marketing courses.

315 Marketing Management (3)

Analysis and solution of problems involving pricing, distribution, product strategy, promotion and marketing research from management view point. Economic and social responsibilities of marketing function emphasized. Pre: BEc 341.

321 Marketing Information Analysis (3)

Research aids to marketing management; nature of the research process; planning research including problems of sampling and measurement; experimental and non-experimental methods and techniques; analysis of data. Pre: BAS 302 or consent of instructor.

331 Advertising Management (3)

Advertising decision making, advertising's role in marketing mix, primary demand stimulation, selective demand stimulation, building complete programs, advertising agency relationships.

341 Retailing Management (3)

Principles, functions and analysis of problems in retailing: location and layout; merchandise planning, buying and selling; organization; expense analysis and control; coordination of store activities.

361 Seminar in Marketing (3)

Study and discussion of significant topics and problems in the field of marketing. Pre: consent of instructor and usually senior standing.

381 Multi-National Marketing (3)

Methods and organization peculiar to international marketing, with emphasis on practical and technical aspects.

391 Marketing Strategies (3)

Decision-making by the marketing executive; an integration of all elements of the marketing program based on actual business situations. Pre: 315, 321 and one other marketing course above the 300 (Principles) level or consent of instructor.

Personnel and Industrial Relations (PIR)

200 Career Placement (1)

Preparation for effective career placement; personal inventory, selecting field of interest, job market, preparation of resumes, employment interviews, employment decisions, initial career experience, progress. Primarily for juniors and seniors.

300 Personnel and Labor Relations (3)

Introduction to labor and trade unionism; introduction to personnel management principles and practices.

351 Personnel Selection and Training (3)

Policies and procedures essential to staffing, developing and maintaining proper relationships at all organizational levels.

353 (352) Personnel Compensation (3)

Wage and salary systems, payments and incentives; fringe benefits, evaluation of jobs at all levels.

361 Labor Problems and Trade Unionism (3)

Problems and economics of labor; history, structure, government, activities of trade unions; social and labor legislation.

363 (362) Collective Bargaining and Dispute Settlement (3)

Principles and concepts of collective bargaining; methods of settling disputes over rights and interests.

365 Labor and Social Legislation (3)

Evolution, interpretation and application of labor and social welfare legislation with special emphasis on impact on labor-management relations.

367 Labor-Management Relations in the Public Service (3)

Review and analysis of the basic factors which distinguish private from public employment relations, and examination of the development of recent legislation and programs on the federal, state and municipal levels. Specific consideration will be given to current problems on the mainland and Hawaii. Pre: 361 or permission of instructor.

DEPARTMENT OF MANAGERIAL ECONOMICS AND QUANTITATIVE METHODS

Business Analysis and Statistics (BAS)

111 Applied Mathematics (3) I, II

Application of mathematical operations to problems in business and economics; linear equations; progressions; theory of sets and functions; elementary matrix notation; differential and integral calculus (including partial differentiation, maxima and minima, Lagrange multiplier techniques). Pre: Math 134.

301-302 Business Statistics (3-3) Yr.

Principles of statistical inference, including frequency distribution, averages, variation, testing hypotheses, estimation of population mean, index numbers, time series, correlation, probability, sampling, chi square and F distribution, analysis of variance. Utilization of statistical data as aid to managerial decisions.

311 Sampling Methods (3) I, II

Design and use of random systematic, stratified and sequential samples for estimation of universe characteristics. Pre: 302.

313 Experimental Business Statistics (3)

Uses of experimental data in judging alternative courses of action; planning an experiment, design for collection of data, analysis of variance and components, interpretation of results. Pre: 302.

321 Introduction to Quantitative Analysis (3) I, II

Tools and techniques for elementary operations research studies; introductory analysis of matrices, determinants and vector analysis for input-output, linear programming and theory of games. Pre: 111, Math 134.

322 Decision Theory (3)

Introduction to decision theory as applied to business problems. Topics include Bayesian decision rules, probabilistic models, and selected topics in mathematical programming. Pre: 321.

351 Electronic Data Processing for Business (3) I, II

Introduction to computer programming with emphasis on business applications. Programming in machine language. Actual practice in solving problems on a computer using a problem-oriented language such as Fortran, Cobol, PL/1, etc.

396 Methods of Scientific Research Applied to Business and Economic Problems (3) II

Study of fundamentals of research methodology, including planning, organizing and executing a research project; techniques of gathering data; use of library facilities and other sources of information; analysis and interpretation of data; art and strategy of presenting findings.

Business Economics (BEc)

Economics 150 is prerequisite to all other courses.

303 Money, Credit and the Capital Market (3) I, II

Nature and functions of money, debt and credit, liquidity; financial institutions and money market analysis; fund flow analysis.

305 Business Enterprise and Business Fluctuations (3) II

Characteristics and causes of business fluctuations; means of coping with recession and inflation by business firms and government; business forecasting.

341 (340) Managerial Economics I (3) I, II

Demand analysis; production analysis relating to factors and products; various forms of imperfect competition; demand creation and selling costs; multiproduct output; technological change; problems of uncertainty. Pre: Math 134, BAS 111.

342 (341) Managerial Economics II (3) I, II

Working concepts and case studies relating to demand analysis and production analysis; problems of demand creation, multifactors and multiproducts, technological change; cases involving working capital, financing and capital budgeting; input-output analysis and programming techniques. Pre: 341.

351 Business Conditions Analysis

Study of the interrelationships of macro economic events and developments to micro economic units. Special attention will be given to the role that GNP, national and regional growth rates, price and employment levels, and monetary and fiscal policies should play in the strategic decision making of the firm. Pre: 341.

355 Analytical Methods of Banking (3)

Application of macro-micro and quantitative approaches to the management of banks. Orientation toward the solution of banking problems through the use of optimization and heuristic methods for normative solutions in areas such as flow of funds, risk criteria, bank portfolio, and long-range planning related to monetary and fiscal policy. Pre: 303, 341, BAS 301.

361 (360) Foreign Trade and American Industry (3) I

Introduction to world trade, its development and current status; study of foreign trade principles, including international commercial problems and policies, tariff policies, and exchange controls that affect exporting and importing industries.

362 (361) Foreign Trade Policy and Finance (3) II

Study of means and ends of international trade; international commodity agreements and commercial treaties, international banking facilities, foreign credits, foreign exchange, foreign investments.

375 Business Enterprise and Public Policies (3) I, II

Study of interrelations between business and government. Special attention to analysis of public policies affecting business management: regulation monopoly and competition; business affected with public interest; use of subsidies to promote public purposes; use of government financing to regulate business.

SCHOOL OF TRAVEL INDUSTRY MANAGEMENT

Real Estate (RE)

300 Real Estate Fundamentals (3) I

Principles of real estate for customer, home owner, business; real estate law, brokerage, management, appraisal, finance.

310 Real Estate Law (3) II

Application of property law to real estate business. Pre: 300.

321 Real Estate Finance and Investment (3) I

Capital needs and investment opportunities in creating, transferring and holding real property; comparison of functions and techniques of financing organizations. Pre: 300, Fin 300.

330 Property Valuation (3) II

Economic, social, legal, physical factors influencing property values; emphasis on local residential market. Pre: 300.

341 Land Economics (3) I

Economic principles and social institutions influencing use and ownership of lands for urban and rural purposes. Pre: Econ 150.

350 Land Development and Planning (3) II

Planning and developing lands in process of changing use. Economic concepts, market forces and institutional factors that influence dynamics of urban growth. Pre: 300.

351 Resort Area Development (3) I, II

Economic, legal and physical factors in use, transfer, development and administration of lands for purposes of tourism.

Transportation (Trans)

351 Economics of Transportation (3) I

Development of major transportation systems and their marketing function in American economy as integral part of process of physical distribution. Pre: Econ 151 or BEc 341.

352 Passenger Transportation (3) II

Analysis of modes of passenger transportation, including rates and services in urban, local, intrastate, interstate and international operation, with particular emphasis on Pacific areas. Impact on areas served. Regulations of carrier operation and passenger travel. Pre: 351.

Travel Industry Management (TIM)

101 Introduction to Travel Industry Management (3) I, II

General principles of hotel management and tourism, particularly from standpoint of close link between the two and rapid developments taking place in these fields. Lectures by leaders of hotel and travel industries.

100, 200, 300, 400 Internship (0-0-1-1) (arr.)

200 hours of paid employment in hotel or tourist industry for each course. Employment obtained by student with help and approval of School.

301 Hotel Management Principles (3) I, II

Basic management functions: planning, controlling, organizing, staffing, directing: emphasis on human factors and quantitative analysis in developing sound philosophy of management. Critical evaluation of current practices in business firms. Emphasis on principles as they affect hotel, restaurant, tourism industries.

314 Institutional Purchasing

Introduction to, and analysis of, the procurement responsibilities in travel industry management. Special emphasis is given to the organized institutions supplying hotels, restaurants, airlines, etc. and the legislation which controls the standards of industrial supplies and goods. Pre: FSA 181.

321 Tourism Principles I (3) I

Study and application of basic components of tourism. Includes philosophy and promotion of tourism, travel counseling, use and evaluation of publicity media, development of tourism at regional, national, international levels.

322 Tourism Principles II (3) II

Travel research and statistics; tourism and its economic significance; preparation and control of tourism budgets; immigration and customs procedures; factors determining priorities in tourist development. Pre: 321.

323 Travel Agency Management (3)

Management principles covering agency organization and operation. Development of individual and group movements; convention proposals. Human relations; IATA and ATC regulations; tariffs and schedules; finances. Linkage with principal travel service businesses.

331 Hotel Design, Engineering, and Maintenance (3) I

Concepts of manager's role in architectural design, engineering and maintenance problems in hotels and resorts, including food service facilities.

334 Hospitality Merchandising and Club Management

Study of micro-economics of the hospitality industry and its marketing problems. Emphasis will be placed on specific factors dealing with food, beverage, and environmental planning. Pre: FSA 181.

351 Studies in Hotel Management Controls (3) I, II

Cost accounting and controls for hotel and food service operations, including budgeting, front office accounting, food and beverage controls, payroll controls, financial analysis. Pre: Acc 202.

361 Law and Regulation for the Travel Industry

Origin, development, and principle of common, statutory, constitutional, international, and maritime law as they relate to the hotel, restaurant, travel and related industries and services. Pre: Law 300.

399 Seminar in Travel Industry Management (3) I, II

Reading and research into problems in the sphere of Travel Industry Management. Limited to students with junior standing or above and at least a 2.5 grade-point ratio. Permission of instructor is required based upon the student's written proposal of content and objectives of his course program. A seminar course under the direction of a single faculty member who will utilize other faculty resources as required by individual student program.

Graduate Courses in Business Administration

At the time this catalog was prepared, the College of Business Administration was in the process of revising its graduate program. For information regarding the Master of Business Administration Program or the graduate courses offered by the CBA, please refer to the MBA Program Bulletin available from the College of Business Administration.

College of Education

THE COLLEGE OF EDUCATION was established as the Teachers College of the University of Hawaii in September 1931, by Act of the 1931 Legislature of the Territory of Hawaii. The Act merged the Territorial Normal School, then preparing elementary school teachers, with the School of Education in the University, then charged with preparing secondary school teachers, into a single teachers college.

Today the College of Education is an upper-division college and graduate professional school. The major role of the College is the pre-service preparation of teachers. Upon completion of two years of study as pre-education majors in the College of Arts and Sciences, qualified candidates are admitted as either elementary education or secondary education majors to pursue a minimum of three more years of planned coursework and student teaching to meet the requirements of the B.Ed. and Professional Diploma. The Bachelor of Education (B. Ed.) is conferred at the end of four years of work and the state Department of Education (DOE) grants the Provisional Teacher's Certificate (Class II). Upon the completion of the Professional Diploma or Master of Education degree programs, the state DOE grants the Professional Teacher's Certificate (Class III). This post-baccalaureate work may be pursued in full-time study or part-time in conjunction with teaching.

Undergraduate work leading to a Bachelor of Science degree in recreation is also offered in the College, and substantive service courses are provided in the areas of health, physical education, and industrial arts.

The College currently offers Master of Education degrees in educational administration, educational communications, educational foundations, elementary education, secondary education, and the M.Ed. and Ph.D. in educational psychology. Information concerning these programs can be obtained from the Graduate Division of the University and from the departments offering the various programs.

Research and development and community service are two other very important aspects of the College's functions. The College provides professional leadership and service to projects in the Pacific islands and Southeast Asia. As the only state-supported teacher education institution in Hawaii, the College, particularly its research and development centers, has responsibility for leading the advance of education in the state through research studies on the learning process and curriculum development of new materials and methods for teaching.

Preservice Teacher Education Program

The current program for all preservice teacher candidates approved by the College and the University Council on Teacher Education includes a strong liberal arts core, professional education courses, and student teaching. In addition, secondary majors complete at least one major in a teaching field of the secondary school, and elementary education majors complete an academic major and a distributive major in courses related to the curriculum in the elementary schools. Requirements are listed in the sections following:

General Education

The general education core requirements of the College of Arts and Sciences constitute most of the non-major courses in the liberal arts and sciences for prospective elementary and secondary teachers. However, requirements for certain teaching majors such as science and mathematics commence in the freshman year, so pre-education freshmen and sophomores should check with the College's division of student services to obtain listings of specific curricula in all teaching fields.

Program of Studies for Elementary Education Majors

Elementary education majors have two options, referred to as elementary generalist and elementary specialist, in preparing for teaching in the elementary school. These options are described in the following sections:

Elementary Generalist Program

1. B.Ed. requirements: minimum of 126 credits
 - a. General education core: 60 credits in liberal arts and science courses.
 - b. Professional education core: 9 credits in social, psychological, and curriculum foundations, and 10 credits in methods courses in the principal subject areas taught in the elementary school.
 - c. Student teaching: 12 credits, full time for one semester.
 - d. Academic major: a minimum of $\frac{3}{4}$ of the credits for the major as specified.*
 - e. Distributive major: a minimum of $\frac{1}{2}$ of the credits in courses specifically related to the elementary school curriculum.*
2. Professional Diploma requirements: minimum of 156 credits, including work completed for the B.Ed. and the following:
 - a. Professional education: 6 additional credits in education courses numbered at the 600 level.

*Specific requirements are available in the College of Education, Division of Student Services.

- b. Academic major: the balance of credits required for the major as specified.*
- c. Distributive major: the balance of credits required in the distributive major as specified.*

Elementary Specialist Program

1. B.Ed. requirements: a minimum of 126 credits
 - a. General education core: 60 credits in liberal arts and science courses.
 - b. Professional education core: 9 credits in social, psychological, and curriculum foundations; 4 credits in language arts and reading methods courses; and a methods course appropriate to the major field.
 - c. Academic major: a minimum of 39 credits in one discipline and other courses as specified.*
 - d. Student teaching: 12 credits.
2. Professional Diploma requirements: a minimum of 156 credits, including work completed for the B.Ed. and the following:
 - a. Professional education: 6 additional credits in education courses numbered at the 600 level.
 - b. Academic major: the balance of credits required for the major and other courses as specified.*

Program of Studies for Secondary Education Majors

1. B. Ed. requirements: a minimum of 126 credits
 - a. General education core: 60 credits in liberal arts courses.
 - b. Professional education core: 9 credits in social, psychological, and curriculum foundations; 3-4 credits in appropriate methods course to the major.
 - c. Teaching field major: 42 credits in the teaching field major and other courses as specified.*
 - d. Student teaching: 12 credits, full time for one semester.
2. Professional Diploma requirements: a minimum of 156 credits, including work for the B.Ed. and the following:
 - a. Professional education: 6 additional credits in education courses numbered at the 600 level.
 - b. Teaching field major: 18 additional credits in the major and/or other courses as specified.*

Teaching Field Majors — Secondary Education

(For B.Ed. and Professional Diploma)

Total number of credits are approximations.*

*Specific requirements are available in the College of Education, Division of Student Services.

AGRICULTURE: 60 credits in agriculture and agricultural technology courses and Ed CI 333.

ARTS: 60 credits in art, including: 18 credits in art history or related studies (aesthetics, music, etc.) including Art 270 and 280; 42 credits in studio courses, including Art 101, Studios A, B, C, D; and Ed CI 336.

BIOLOGY: 32 credits in biology; general physics; organic chemistry; introductory geoscience; history/philosophy of science; introductory calculus, Ed CI 333.

BUSINESS EDUCATION: 60 credits in business, including a minimum of 21 credits in economics, and skills courses in typewriting, shorthand, business and secretarial machines and accounting, and Ed CI 348, 349.

CHEMISTRY: 32 credits in chemistry; general and modern physics; introductory biology and geoscience; history/philosophy of science; integral calculus; Ed CI 333.

DISTRIBUTIVE EDUCATION: 60 credits in business, including a minimum of 21 credits in economics, marketing and management; and Ed CI 348, 349.

ENGLISH: 60 credits in English and related subjects; and Ed CI 330, 331, 345.

FOREIGN LANGUAGES: 60 credits in a foreign language (Chinese, Japanese, French, German, or Spanish) and related subjects; and Ed CI 335.

GEOSCIENCES: 32 credits in geosciences; general and modern physics; inorganic chemistry; introductory biology; history/philosophy of science; integral calculus; Ed CI 333.

HEALTH AND PHYSICAL EDUCATION: 60 credits in health and physical education; and Ed CI 343.

HOME ECONOMICS EDUCATION: 65 credits in home economics including management and family economics, housing and equipment, clothing and textiles, food and nutrition, human development, and sciences (minimum of 20 credits) ; and Ed CI 371.

INDUSTRIAL ARTS EDUCATION: 60 credits in industrial and technological education; and Ed CI 346, 347.

MATHEMATICS: Junior High—30 credits in mathematics; Senior High—42 credits in mathematics; and Ed CI 334.

MUSIC, INSTRUMENTAL: 62 credits in instrumental music and related subjects; and Ed CI 337.

MUSIC, VOCAL: 58 credits in music theory and voice and related subjects; and Ed CI 337.

PHYSICS: 32 credits in physics; inorganic, qualitative and physical chemistry; introductory biology and geoscience; history/philosophy of science; differential equations; Ed CI 333.

SOCIAL STUDIES: 60 credits in social sciences (anthropology, economics, geography, history, political science, psychology, sociology, or interdisciplinary courses in the social sciences) to include a major from one of the disciplines, the remainder to be in related social sciences; and Ed CI 332.

SPEECH: 60 credits in speech and related subjects; and Ed CI 339, 331, 345.

**Program for
Vocational Agriculture Education Majors**

Prospective vocational agriculture education majors have the options of enrolling in the College of Arts and Sciences for the freshman and sophomore years, followed by transfer to the College of Education for the junior, senior, and fifth years, or in the College of Tropical Agriculture for the bachelor's degree, followed by transfer to the College of Education for the fifth year. To be admitted for work in the College of Education, vocational education majors must meet the general entrance requirements of the College.

**Program for
Business Education and Distribution Education Majors**

Prospective business education and distributive education majors enroll in the University of Hawaii Community College System's transfer programs for their pre-education (liberal arts and science core) and selected office and business education skill courses such as typewriting, shorthand, business machines, as partial fulfillment for the Bachelor of Education requirements. Candidates transfer to the College of Education at the end of the sophomore year to complete professional education and teaching field major work during the junior, senior, and fifth years. Students planning to transfer to the College of Education should consult with the pre-education adviser and/or the business education adviser in the division of student services.

**Program for
Vocational Home Economics Education Majors**

Prospective vocational home economics education majors enroll in the College of Tropical Agriculture's division of human resources development for their general education during the freshman and sophomore years. They transfer to the College of Education at the end of the sophomore year to complete their program of studies for the bachelor's degree and Professional Diploma. Their major teaching field work is completed through courses taken in the departments of human development, fashion design, textiles and merchandising, food and nutritional science, and home economics.

Program for Industrial Arts, Technical and Industrial Vocational Education Majors

To prepare competent teachers for expanding industrial arts education and technical-industrial vocational education positions in the junior-senior high schools and community colleges, a coordinated program of preparation has been established between the College of Education and the Honolulu Community College. Prospective teachers enroll in the Honolulu Community College for their first and second years of the program, taking courses in technology and general education. Candidates transfer to the College of Education at the end of their sophomore year to complete professional education and teaching field major work during the junior, senior, and fifth years.

Program for Recreation Leadership Majors

The department of health and physical education offers a program of study leading to a B.S. degree in Recreation Leadership. This four-year program is centered in training leaders in community recreation and related fields of recreation. Interested persons should contact the chairman of the department.

Admission Requirements

The College of Education admits students who have junior standing or higher. Applicants pursuing all programs except those leading to the M.Ed. and the Ph.D. degrees, must arrange a personal interview with the staff of the College of Education, division of student services. (Personal recommendations are accepted in lieu of interview for out-of-state applicants.) Additional interviews for applicants for the B.S. degree in recreation leadership are arranged with the department of health and physical education.

In addition to the University requirements listed on pages 39-44 students entering the College are required:

1. To be competent in written English and have adequate speech patterns;
2. to have an absence of emotional or adjustment problems;
3. to provide letters of recommendation giving evidence of being able to adjust to the demands of teaching and to cope with the problems of working with students;
4. to obtain medical clearance showing no physical limitations which would interfere with teaching effectiveness;
5. to present transcripts of *all* college records showing a cumulative grade-point average according to the following classification:

- a) for entering juniors, seniors, and Professional Diploma candidates, a cumulative GPA of at least 2.0
 - b) for all students majoring in second education, a minimum GPA in their teaching field of at least 2.3
6. to submit an application form and all transcripts of previous collegiate work to the division of student services, College of Education, by July 1 for the fall semester, and by November 1 for the spring semester.

The B.Ed. Degree. The College awards a Bachelor of Education degree upon the completion of four years of work at the University. To be eligible for the B.Ed. degree, the student must:

- 1. Fulfill all University requirements;
- 2. complete the College of Education undergraduate curriculum in elementary or secondary education;
- 3. acquire a minimum aggregate of 114 semester hours of credit in addition to student teaching;
- 4. have a cumulative GPA not less than that required for admission to the College;
- 5. file for graduation and pay \$5 fee at least one semester prior to intended graduation date.

The Professional Diploma. In recognition of successful completion of a post-baccalaureate teacher education program for teaching at the elementary or secondary school level, the College awards the Professional Diploma. To be eligible for the Professional Diploma, the student must:

- 1. Meet all admission requirements of the College of Education;
- 2. have been awarded a bachelor's degree from an accredited institution;
- 3. have completed student teaching with a grade of no less than C;
- 4. have completed all course requirements for the Professional Diploma;
- 5. have acquired a minimum of 156 semester hours;
- 6. have a final cumulative GPA not less than that required for admission to the College;
- 7. have filed for graduation and paid a \$2.50 fee not later than the semester prior to intended graduation date.

Student Teaching

The division of field services of the College of Education plans for, arranges, and coordinates the student teaching experiences in the elementary and secondary public and non-public schools of Hawaii. In spite of the hundreds of requests for student teaching during the year, selection of assignments will consider as many personal preferences as possible.

Semester preferences will be considered to the extent they allow a balance of teachers in the field during the fall and spring.

Prior to registering for student teaching (Ed CI 390), a student is required:

1. To be enrolled in the College of Education as a classified student;
2. to complete a 30-hour field experience with children of the age group requested in student teaching;
3. to have a cumulative GPA not less than that required for admission to the College, and a GPA in the teaching field (secondary level only) not less than 2.3;
4. to be cleared for student teaching by the division of student services;
5. to be accepted for student teaching by the division of field services upon the recommendations of the instructor(s) of the appropriate methods course (s) ;
6. to request student teaching of the division of field services no later than October 15 or March 15 for teaching during the subsequent semester. (There is no student teaching during the summer session.)

Certification Programs

Administrative Intern Program. School administration credentials—elementary, intermediate, secondary and adult—are granted by the state Department of Education after the following requirements have been satisfied: (1) possession of a professional teaching certificate; (2) completion of five years of successful teaching experience; (3) 15 graduate credits in administration, supervision and curriculum; and (4) successful completion of the administrative intern program.

The administrative intern program is sponsored by the College and the state Department of Education. To be admitted to the program, the candidate must have five years of teaching experience, hold the professional certificate and successfully pass the annual examinations administered by the state Department of Education. Interested candidates should confer with the chairman of the department of educational administration.

Certification in School Psychology. There are two levels in the school psychology program—the certificate level and the doctoral level. The certificate program is a 48–60 semester credit program of professional and academic courses. The M.Ed. degree in psychology is included as part of the certification requirement. Students who complete the certificate program will be recommended for school psychology credentials in Hawaii and other states. The doctoral level program is designed to prepare supervisors, college instructors and researchers in the field. Program advise-

ments are available for qualified graduate students in the department of educational psychology.

School Counseling Certificate Program. The counseling and guidance program is designed for students who wish to develop competency in counseling and guidance in the schools, and to meet certification requirements in Hawaii or other states. The master of education degree may be completed as part of the requirements for the professional level certificate. Individuals who complete the counseling and guidance program satisfactorily are recommended for the counselor certification. Those interested should confer with the counselor-educator in the department of educational psychology.

Teaching the Mentally Retarded Certificate Program. The College offers a one-year graduate program leading to recommendation for certification as a teacher of the mentally retarded. Graduates with a degree in an area other than education may also receive recommendation for certification to teach mentally retarded children upon completion of a one-year program. Courses taken for certification may be counted toward a master's degree in educational psychology with emphasis in special education. Interested students should confer with the instructors in special education in the department of educational psychology.

Fellowship support is available for students in the area of mental retardation.

Teaching the Emotionally Disturbed Certificate Program. The University in cooperation with the state Department of Education is currently developing certification requirements in the area of the emotionally disturbed. See course offerings in this area.

Fellowship support is available for students in the area of the emotionally disturbed.

Teaching the Culturally Disadvantaged Certificate Program. The University of Hawaii in cooperation with the state Department of Education is currently developing certification requirements in the area of the culturally disadvantaged. The Hawaii Teacher Corps, a federally financed two-year graduate program, prepares teachers to teach the disadvantaged children and youth. For further information concerning this program, contact the director of Hawaii Teacher Corps.

EDUCATION COURSES

See pp. 4-5 for a discussion of course descriptions.

Curriculum and Instruction (Ed CI)

Professors R. ALM, CARR, IN, MARTIN, NELSON, POYZER; Associate Professors BRAUN, CAMPBELL, FULTZ, HAYES, IHARA, INN, JENKINS, MORRIS, PICKENS, REDDIN, TULL, WHITMAN; Assistant Professors BROWN, MOORE, PICARD, THOMPSON, UEHARA

Courses numbered from 312 through 349 have as prerequisite enrollment in the College of Education as a classified student.

- 312 Foundations in Curriculum and Instruction (3) I, II**
 Braun, Brown, Fultz, Inn, Jenkins, Martin, Reddin
 Study of objectives and organization of school's curriculum; discussion of principles and practices; roles of teacher in school. Sections: early childhood education, elementary education, secondary education.
- 319 Children's Literature (2) I, II**
 Jenkins, Reddin
 Acquaintance with wide range of children's books; criteria for judging literature on basis of needs and interests. Pre: 312 or concurrent registration.
- 320 Language Arts, Elementary (2) I, II**
 Jenkins, Reddin
 Modern approach to teaching of language arts—reading, oral, written expression. Pre: 312 or concurrent registration.
- 321 Reading, Elementary (2) I, II**
 Braun, Uehara
 Survey of reading process: development of reading readiness, word recognition, comprehension, reading rate, vocabulary, reading interests, reading in content areas. Selection and use of reading materials, evaluation and appraisal of reading progress.
- 322 Social Studies, Elementary (2) I, II**
 Inn
 Major purposes: to point out special contributions of social studies to elementary curriculum; to aid students in developing sound instructional programs and procedures in elementary social studies. Pre: 312 or concurrent registration.
- 323 Science, Elementary (2) I, II**
 Campbell, Carr
 Science education in elementary school; methods and materials; laboratory activities selected from new science curricula. Pre: 312 or concurrent registration.
- 324 Mathematics, Elementary (2) I, II**
 Picard
 Purposes, procedures, scope, organization in developing underlying concepts of elementary mathematics; analysis of new elementary mathematics programs; techniques, relative merits, roles of inductive and deductive approaches to new ideas. Pre: 312 or concurrent registration; Math 111.
- 325 Trends in the Teaching of Elementary Mathematics (2) I, II**
 Staff
 Mathematical content necessary for effective use of newer approaches; nature of number systems; introduction to theory of numbers; basic concepts of algebra; foundations in geometry. Open for credit to students who took elementary mathematics methods prior to September 1962.
- 326 Creative Art, Elementary (2) I, II**
 Pickens
 Understanding scope and importance of art in elementary school curriculum, creative use of art media through laboratory experiences. Pre: 312 or concurrent registration; Art 101.
- 329 Creative Expression in Elementary Education (3) I**
 Hayes
 Development of communication skills through creative dramatics, rhythmic movement, related arts. Pre: 312 or concurrent registration, or consent of instructor.
- 330 Language Arts, Secondary (3) I, II**
 J. Alm
 Teaching of speaking, reading, writing, listening in secondary school; literature, grammar, usage, spelling. Pre: 312 or concurrent registration.

- 331 Teaching of Reading in Intermediate and High School (2) I** **R. Alm**
Techniques and materials for teaching reading and improving reading skills in intermediate and high school. Pre: 312 or concurrent registration.
- 332 Social Studies, Secondary (3) I, II** **Fultz**
Scope and organization of social studies in secondary school; development of social knowledge and understanding. Pre: 312 or concurrent registration.
- 333 Science, Secondary (3) I** **Campbell**
Purposes and procedures; development of scientific attitude; review of major generalizations of biological and physical sciences. Pre: 312 or concurrent registration; basic courses in physics, chemistry, biology.
- 334 Mathematics, Secondary (3) I** **Whitman**
Purposes and procedures; development of basic mathematical concepts. Pre: 312 or concurrent registration; Math 311, 351.
- 335 Foreign Languages, Secondary (3)** **Staff**
1. European Languages I, II
2. Asian Languages II
Techniques and materials; aims, motivation, tests; infusion of cultures; use of instructional aids. Pre: 312 or concurrent registration.
- 336 Art, Secondary (3) I** **Pickens**
Purposes and procedures; the arts in relation to all school subjects. Pre: 312 or concurrent registration; consent of instructor.
- 337 School Music, Secondary (3) I, II** **Staff**
Objectives, materials, procedures of general, instrumental, choral music in secondary school. Pre: 312 or concurrent registration.
- 339 Speech and Dramatics, Secondary (3) I, II** **Byers**
Techniques for teaching types of speech and play analysis and direction; production and management problems. Pre: 312 or concurrent registration.
- 342 Mathematics in the Junior High School (2) I** **Staff**
Arithmetic beyond fundamental processes; "general mathematics" courses; arithmetic in other courses. Pre: 312 or concurrent registration.
- 343 Physical Education, Secondary (3) I, II** **Thompson**
Methods and materials in conduct of physical activities program; techniques in leadership; selection of activities and program evaluation. Pre: 312 or concurrent registration.
- 345 Literature for Adolescents (2) II** **R. Alm**
Literature for secondary school level; helping students appreciate significance and meaning of literature; materials suitable for varying levels of ability and interests. Pre: 312 or concurrent registration.
- 346 Methods of Instruction, Industrial Education (3) I** **Poyzer**
Techniques of individual and group instruction in laboratory and related classes; evaluation of various methods. Pre: 312 or concurrent registration.
- 347 Organization and Management of Industrial Education (2) II** **Poyzer**
Organization of instruction; handling supplies; maintaining equipment and tools; purchasing materials; keeping records; making inventories. Pre: 312 or concurrent registration.
- 348 Typewriting and Shorthand (2) I** **Staff**
Theory and methods of teaching typewriting and shorthand. Pre: 312 or concurrent registration; courses in advanced typewriting; intermediate shorthand.
- 349 Bookkeeping and Office Practice (2) II** **Staff**
Teaching bookkeeping, office practice and other subjects in secondary school business education curriculum. Pre: 312 or concurrent registration; course in business and secretarial machines; Acc 201-202.
- 371 Home Economics Education (3) I, II** **Tull**
Curriculum design. Current educational philosophies and practices in home economics education. Teaching materials and techniques.

- 390 Student Teaching (12) I, II** **Staff**
 Supervised experience in public schools. Sections: (1) elementary education, (2) secondary education. Course taken on mandatory pass-fail basis. Pre: requirements for registration listed under "Student Teaching."
- 397 New Materials and Methods for the Teaching of Elementary Mathematics (3) II** **Staff**
 Experimental course of in-service education for teachers of elementary school mathematics. Course features weekly film discussion and critique of written assignments using the University of Illinois Arithmetic Project in-service materials. Pre: consent of instructor.
- 399 Directed Reading (arr.) I, II** **Staff**
 Individual reading or research. Limited to senior majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in education. Pre: consent of instructor and department chairman.
- 437 Curriculum Development, Industrial Education (2) II** **Poyzer**
 Development of contemporary curricula and programs spanning the industrial education continuum. Pre: I.E. major or instructor in I.E.
- 439 The Business Education Curriculum (3) I, II** **Morris**
 Study of philosophy, principles, development of business education in secondary schools. Pre: 348 or 349 or consent of instructor.
- 460 Distributive Education (3) I** **Morris**
 Principles, materials and methods of teaching distributive education subjects.
- 471 Special Problems in Home Economics Education (2) I, II** **Tull**
 Individual and group problems selected according to interests and needs of fourth- and fifth-year students in home economics education. Development of teaching materials.
- 493-494 Senior Honors Thesis (2-2) Yr.** **Staff**
 For seniors in Honors Program.
- 497 Economic Education: Theory and Practice (3) II** **Staff**
 For teachers of social studies K-12. Examination of economy with special emphasis on those areas which pertain to social studies curriculum. Films, filmstrips, simulations, and most recent resource material will be examined. Pre: consent of instructor.
- 520 Supervision of Student Teaching (3) I** **Staff**
 Principles and methods; role of supervisor; human relations in supervision of student teaching. Pre: teaching experience; consent of instructor.
- 540 Practicum in Curriculum Development (arr.) I, II** **Staff**
 Designed for teachers-in-service to upgrade subject matter and develop new teaching methods and materials for instruction in courses of study K-12 in: (1) art, (2) business, (3) English, (4) foreign language, (5) health and physical, (6) home economics, (7) industrial, (8) mathematics, (9) science, (10) social studies, (11) speech, (12) reading, (13) general curriculum and teaching problems, (14) Asian studies. Development of curriculum materials and methods by participating teachers. Pre: related undergraduate methods course; teaching experience. Field of study must be designated at registration.
- 619 Children's Literature in the Elementary Curriculum (3) I, II** **Jenkins, Reddin**
 Examination in depth of traditional and modern literature for children, with emphasis upon genre, historical development, research, curriculum development. Pre: 319.
- 620 Teaching Reading in the Elementary School (3) I, II** **Uehara**
 Developmental and psychological aspects of the reading process, studying current trends, research, techniques of evaluation. Pre: 321.
- 621 Modern Language Arts Program, Elementary (3) II** **Staff**
 Critical examination of educational procedures in teaching of language arts; current research including that related to language deprivation and linguistic science. Pre: 320 and teaching experience.
- 622 Elementary School Curriculum (3) I, II** **Braun, Inn, Jenkins**
 Theoretical foundations of curriculum development; curriculum research; critical examination of current practices in curriculum development for elementary school. Pre: 312 or equivalent; teaching experience.

623 The Elementary Science Curriculum (3) I, II**Card**

Application of recent developments in science, curriculum construction and learning theory to elementary school. Science content and methodology stressed. Pre: 323 and teaching experience.

624 The Elementary Mathematics Curriculum (3) II**Picard**

Analysis of research relating to teaching and learning arithmetic, apply research findings to classroom procedures. Appraisal of recent curricular trends and critical examination of assumptions underlying proposed changes. Pre: 324 and teaching experience.

625 The Elementary Social Studies Curriculum (3) II**Inn**

Examination and evaluation of social science content, societal values and research findings as basis for development & revision of social studies materials, texts, curriculum guides, methodology. Pre: 322 and teaching experience.

626 Art in Elementary Education (3) I**Pickens**

Principles of and problems in teaching art in elementary school; curriculum development and current approaches in art education; laboratory experiences in art media. Pre: 326; Art 101.

629 Curriculum Development in Creative Expression (3) I**Hayes**

Leadership training for teachers of creative dramatics, rhythmic movement, related arts. Pre: 329 or consent of instructor.

634 Extraclass Activities in Secondary Schools (2) I**Staff**

Exploring potential contribution and utilization of extraclass activities: homeroom, student council, athletics, intramurals, clubs, dramatics, publications, speech activities, assemblies, etc.

635 Junior High School Curriculum (3) I**Fultz, Martin**

Programs for intermediate school; relationship of teachers, administrators, parents; curriculum problems; evaluation. Pre: teaching experience.

636 Secondary School Curriculum (3) I, II**Fultz, Martin**

Principles and techniques of curriculum improvement at secondary school level. Pre: teaching experience.

637 Art in Secondary Education (3) I**Pickens**

Principles of and problems in teaching art in secondary school; current approaches in teaching art. Pre: 336 and consent of instructor.

640 Seminar in Teaching Fields (3) I, II**Staff**

Study of trends, research, and problems of implementation in special areas of teaching: (1) business, (2) English, (3) foreign language, (4) health and physical, (5) home economics, (6) industrial, (7) mathematics, (8) reading, (9) science, (10) social studies, (11) speech, (12) interdisciplinary, (13) art, (14) creative expression. Pre: undergraduate special methods course in appropriate teaching field; teaching experience; consent of instructor. Field of study must be designated at registration.

643 Public School Curriculum for Physical Education (3) I, II**Little**

Detailed examination of contents of adequate curriculum for physical education in public schools, K-12. Pre: 343, 636, HPE 203, or consent of instructor. (Identical with HPE 643.)

646 Reading Difficulties (3) I, II

Causes, prevention, and correction. Evaluation and remedial practices useful to classroom teacher. Pre: course in teaching of reading.

647 Clinical Procedures in Reading (3) I, II

Diagnosis; methods and materials for improvement of an individual's reading ability. Pre: 646; consent of instructor. May be repeated once for credit.

657 Community College (3) II**Staff**

Development of two-year comprehensive community college in U. S.; its emerging role in higher education. Functions, organization, curricular structure, achievement in relation to objectives, and crucial issues examined. Pre: consent of instructor. (Identical with Ed EF 657.)

INDUSTRIAL EDUCATION

- 667 Curriculum Trends in Early Childhood Education (3) I** **Reddin**
Study of current issues in nursery, kindergarten, early elementary education, with emphasis on research and theory basic to curriculum development and program planning. Pre: 312 or equivalent; teaching experience.
- 699 Directed Reading and/or Research (arr.) I, II** **Staff**
Individual reading and/or research. Pre: consent of instructor and department chairman.
- 722 Seminar in Elementary Curriculum Foundations (3) II** **Inn, Jenkins**
Advanced study in development and improvement of curriculum of elementary schools. Pre: 622; consent of instructor. May be repeated once for credit.
- 733 Seminar in Curriculum, Secondary (3) I, II** **In, Martin**
Advanced study in development and improvement of curriculum of secondary schools. Required for Plan B M.Ed. candidates in their final semester or summer session. Pre: 636; consent of instructor. May be repeated once for credit.
- 737 Foundations in Art Education (3) II** **Pickens**
Advanced study in development and growth of art in secondary education. Pre: 336; consent of instructor; Phil 500 desirable.

Industrial Education (IE)

- 300 Industrial Crafts—Jewelry and Lapidary Processes (2) I**
Design, processes and materials of jewelry making; lapidary processes and materials for polishing semi-precious gemstones; black coral polishing and mounting.
- 301 Industrial Crafts—Leather (2) II**
Design and fabrication of leather products. Materials and processes taught through creative projects and problems.
- 302 Industrial Crafts—Plastics and Wood Sculpture (3) II**
Design and fabrication of plastic projects; materials and processes of metal enameling; other industrial crafts native to Hawaii.
- 303 Advanced Wood Fabrication and Technology (3) I**
Nomenclature, setup and operation of power equipment. Design, patterns, jigs, templates; production procedures.
- 304 Advanced Metal Fabrication and Technology (3) II**
Organization, layout, equipment, management, uses of instructional material. Selected projects in benchmetal, forging, heat-treating, machine shop, oxyacetylene welding, cutting.
- 307 Advanced Drafting and Design (3) II**
Drafting and design principles in fabrication of industrial products; problems of wood, metal, other materials; architectural drafting. Application to instruction.
- 309 The Graphic Arts (3) I**
Survey course for industrial education majors and others desiring experiences in printing and allied industrial processes. Job press, multilithography, photography as applied to printing, related technical and production processes.
- 348 Industrial Arts for Elementary Teachers (2) II**
Hand and simple machine tool instruction taught through selected elementary education projects and units.
- 401 Problems in Industrial Education (arr.) I, II**
Program arranged for specialization in several technical areas. May be repeated for total of 5 credits.
- 402 Improvement of Instruction, Industrial Education (arr.) I, II** **Poyzer**
Consideration of problems in teaching industrial education. May be repeated for total of 5 credits.
- 764 Seminar in Industrial Education (2) II** **Poyzer**
Individual study of special problems. May be repeated once for credit.

Educational Administration (Ed EA)

Professors CROSSLEY, EVERLY, JACKSON, YUCKER; Associate Professors INGILS, JOHNSON

600 Theory of Administration (3) I, II

Johnson

Critical review of key current and classic writings in theory and practice of administration; development of comprehensive, integrated understanding of nature of administration. Pre: consent of instructor. (Same as Interdisciplinary Studies 600.)

610 School-Community Relations (3) I

Crossley

Application of principles, techniques, policies, organization of school-community information program. Pre: consent of instructor.

620 School Finance (3) II

Staff

School revenues, apportionments, budgetary procedures, costs, business management. Pre: consent of instructor.

623 Administrative Problems in Physical Education (3) I, II

Chui

Current problems and recent trends in conduct of physical education programs in educational settings. For administrators, teachers, graduate students in physical education and related fields. Pre: HPE 423 or equivalent and consent of instructor. (Identical with HPE 623.)

630 School Law (3) I

Johnson

Functions, relationships, responsibilities of school districts and school personnel with interpretations of legal status as shown by constitutions, statutes, court decisions. Pre: consent of instructor.

640 Systems Analysis in Educational Administration (3) II

Yucker

Designed for management personnel who wish to pursue modern ideas of system analysis and project management and the approaches which lead to effective planning, programming, and budgeting. Pre: college algebra, rudiments of management theory; consent of instructor.

650 School Personnel Practices (3) I, II

Crossley

Recent theory and practices with emphasis on philosophy and democratic aims, principles, models and research in human relations, leadership, group processes taken from anthropology, psychology, sociology, educational administration.

660 School Plant (3) I

Ingils

Problems and techniques in school plant planning, operation, maintenance; working with other agencies and with classified personnel. Pre: consent of instructor.

670 School Supervision (3) I

Ingils

Principles of supervision and development of supervisory programs. Pre: consent of instructor.

680 School Organization (3) I, II

Johnson

Function of teacher in school administration; state organization of public education; Hawaii school law and state Department of Education regulations. Pre: teaching experience (may include student teaching) or consent of instructor.

685 Educational Administration: Theory and Principles (3) I, II

Jackson

Theory and principles of administration. Required for M.Ed. Pre: consent of instructor.

699 Directed Reading and/or Research (arr.) I, II

Staff

Individual reading and/or research. Pre: consent of instructor and department chairman.

700 Research Seminar in Educational Administration (3) I, II

Johnson

Basic concepts of research in educational administration. Study and discussion of significant topics and problems; preparation and reporting of scholarly paper. Required of Plan B M.Ed. candidates. Pre: consent of instructor.

720 Seminar and Internship in Administrative Leadership (arr.) I, II

Staff

School administrator as curriculum and personnel leader in school organization; techniques of administrative control; strategies in leadership functions. Intern experience

EDUCATIONAL COMMUNICATIONS

in schools. Pre: admission to state Department of Education Administrative Intern Program, or admission to East-West Center program, or consent of instructor.

770 Seminar in School Supervision (3) II

Crossley

Application of methods and tools of supervision; faculty meetings; classroom observation; conferences; evaluation. Pre: 670, teaching experience, or consent of instructor. May be repeated.

780 Seminar in Educational Administration (3) I, II

Staff

Analysis of selected problems in school administration. (1) Elementary, (2) intermediate, (3) secondary, (4) adult, (5) technical and vocational, (6) community college, (7) higher education. Pre: 670, 680, 685, or consent of instructor. May be repeated.

Educational Communications (Ed EC)

Professor WITTICH; Associate Professors McBEATH, REED, SANDERSON; Assistant Professors BUTLER, KUCERA, MENDELSON; Instructor WILEY

314, its equivalent, or consent of department chairman is prerequisite to all other courses.

314 Audio-Visual Techniques (2) I, II

Wiley, Staff

Nature and use of educational media as they relate to pupil needs in classroom learning situations. Identification, use and evaluation of audio-visual instructional materials; application of known principles in educational media in classroom communications.

399 Directed Reading (arr.) I, II

Staff

Individual reading or research. Limited to senior majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in education. Pre: consent of instructor and department chairman.

599 Workshop in Educational Media (1) I, II

McBeath, Sanderson

Concentrated study and practical experience in utilization of educational media through 8 hours of lecture-demonstrations and 8 laboratory hours for each 1-credit sequence. May be repeated through workshops covering different media up to maximum of 3 credits.

614 Audio-Visual Media Systems (3) I, II

Butler, Wittich

Study of educational communications principles and their practical relationship to new educational media; techniques for design and utilization of combinations of media, both projected and non-projected, audio and visual, leading toward achievement of instructional goals; investigation of new teaching strategies: systems analysis, self-instructional, interrelated techniques. Pre: 314 or equivalent.

620 Introduction to Instructional Materials Production (3) I, II

Butler, Mendelson

Preparation of two- and three-dimensional instructional materials, charts, graphs, learning displays, pictures, slides, overhead transparencies, manipulative tactile materials.

623 Survey and Production of Asian Study Materials (3) II

Butler

Selection, evaluation and use of instructional materials available to teachers of secondary school Asian studies subjects. Adapting existing materials or creating new materials: maps and models, audio recordings, flat pictures, slide sets, projectuals, film-strips, realia and films.

625 Production of Educational Film and Multimedia

Presentations (3) II

Mendelson

Planning and producing educational still and motion pictures, communication and aesthetic theories as related to planning and production. Emphasis on meeting curriculum goals through systematic development of film.

630 Television in Education (3) I, II

Kucera, Reed

Research backgrounds; development and utilization of television in education including fundamentals of television production and teaching with emphasis on utilization of television in school.

- 635 Advanced Educational Television (3) II** **Kucera, Reed**
 Research and study of educational development and utilization of instructional television with emphasis on ETV and systems approach to multi-media instruction in specific learning situations. Pre: 630, its equivalent, or consent of instructor.
- 640 Programmed Learning (3) II** **McBeath, Wiley**
 Learning theory, experimental procedures and related systems and readings in study and development of programmed learning. Evaluation, selection and utilization of programs in classroom. Pre: Ed EP 672 or consent of instructor. (Identical with Ed EP 640.)
- 699 Directed Reading and/or Research (arr.) I, II** **Staff**
 Individual reading and/or research. Pre: consent of instructor and department chairman.
- 700 Seminar in Educational Media Research (3) I, II** **Butler, Kucera, Mendelson, Wittich**
 Review of general and current audio-visual research. Applications of same to problems in improvement of instruction.
- 710 Seminar in Organization and Administration of Media Programs (3) II** **Butler, Kucera, Mendelson, Wittich**
 Current principles and practices in organization and administration of programs utilizing new learning media: audio-visual, automated learning, educational television, facilities for such purposes.

Educational Foundations (Ed EF)

PROFESSORS AMIOKA, ANDERSON; ASSOCIATE PROFESSORS BOYER, JAECKEL, KEPPEL, KOBAYASHI, POTTER, STUEBER; ASSISTANT PROFESSOR RUST

Students enrolled in colleges other than the College of Education are asked to confer with the department chairman before enrolling in 310.

- 310 Foundations of American Education (3) I, II** **Staff**
 Contemporary educational theory and practice as related to major historical, philosophical and social factors in American culture.
- 399 Directed Reading (arr.) I, II** **Staff**
 Individual reading or research. Limited to senior majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in education. Pre: consent of instructor and department chairman.
- 409 Culturally and Economically Disadvantaged Pupil (3) I, II** **Staff**
 Survey of social and psychological factors related to the culturally and economically disadvantaged pupil and his education. Review of local resources and facilities to assist these pupils. Pre: consent of instructor. (Identical with Ed EP 409.)
- 445 Educational Sociology (3) I, II** **Staff**
 Examination of development of theoretical and practical aspects of social structure and their relationship to education. Pre: 310 or 3 hrs. of sociology; consent of instructor.
- 480 Anthropological Applications (3) II** **Staff**
 Education as means of transmitting culture. Socialization in non-literate societies; universal aspects of process. Cross-cultural education. (Identical with Anth 480.)
- 493-494 Senior Honors Thesis (2-2) Yr.** **Staff**
 For seniors in Honors Program.
- 497 Education for a World Without War (3) I** **Boyer**
 Study of probabilities, consequences, and causes of war in the atomic age. Exploration of proposed solutions as a basis for developing educational theory and practices.

EDUCATIONAL FOUNDATIONS

- 650 Historical Foundations of Western Education (3) I, II** **Jaeckel, Keppel, Rust, Stueber**
History of European thought and practice as basis for study of modern education.
- 651 History of American Education (3) I, II** **Jaeckel, Keppel, Rust, Stueber**
Introduction to history of American educational thought from 17th century to present.
- 652 History of Education in Hawaii (3) I, II** **Stueber**
From Cook's discovery to the present. Social and intellectual influences on development of Islands' culture; emphasis upon the role of public and private schools in developing a common language community. Pre: 310 or equivalent.
- 657 Community College (3) II** **Staff**
Development of two-year comprehensive community college in U.S.; its emerging role in higher education. Functions, organization, curricular structure, achievement in relation to objectives, crucial issues. Pre: consent of instructor. (Identical with Ed CI 657.)
- 660 Philosophy of Education (3) I, II** **Amioka, Boyer, Kobayashi, Stueber**
Philosophical considerations essential to theories of education. Pre: student teaching.
- 669 Foundations of Comparative Education (3) I, II** **Kobayashi, Rust**
Introduction to the comparative analysis of educational processes in different societies.
- 670 Comparative Education: Europe and America (3)** **Rust**
Comparison of ways in which contemporary Western societies undertake to meet their educational problems.
- 671 Comparative Education: Asia (3) I** **Anderson, Kobayashi**
Educational institutions, practices and problems in Asian countries, viewed against backdrop of their traditional cultures.
- 681 The Church and the School (2)** **Staff**
Church, state and school relationships in U.S., Canada, Latin America and Europe. Pre: 660.
- 683 Social Foundations of Education (3) I, II** **Boyer, Keppel, Rust**
Impact on education of major social trends and forces operating in American society; social change and education. Pre: consent of instructor.
- 685 Education in America (3) I** **Kobayashi, Rust**
Overview of American educational scene from nursery schools to graduate and professional schools, public and private; problems of support, organization, curriculum, methods, teacher preparation. Open to Asian students only.
- 699 Directed Reading and/or Research (arr.) I, II** **Staff**
Individual reading and/or research. Pre: consent of instructor and department chairman.
- 751 Recent History of American Education (3) II** **Jaeckel, Keppel, Stueber**
19th- and 20th-century history of American educational thought and practice. Pre: 650 or 651.
- 757 Educational Utopias (2) II** **Staff**
Intensive study of English translations of major contributions to Western educational thought from Plato to Dewey. Pre: 650 and consent of instructor.
- 761 History of American Higher Education (3) I, II** **Jaeckel, Keppel**
Genesis and evolution of college and university from colonial America to present. Pre: 651 or 6 hrs. in U.S. history; consent of instructor.
- 763 Seminar in Educational Theory (2) I, II** **Staff**
Focus selected from among the following: (1) educational issues; (2) John Dewey; (3) contemporary educational philosophers; (4) Japanese educational philosophy; (5) history of education. Pre: 660 and consent of instructor. May be repeated.

- 765 Comparative Ideologies and Education (3) I** **Boyer**
Critical analyses of contemporary ideologies with particular reference to implications for educational policies and practices. Pre: 650, 651, or 660.
- 768 Seminar in Problems in Education (2) II** **Staff**
Study and discussion of significant topics and problems. For Plan B M.Ed. candidates in final semester or summer session. Pre: consent of department chairman.
- 770 Seminar in Comparative Education (2) II** **Anderson, Kobayashi, Rust**
Focus selected from among the following: (1) East Asia; (2) South Asia; (3) Southeast Asia; (4) Latin America; (5) Africa; (6) USSR and Eastern Europe; (7) Western Europe; (8) British Commonwealth. Pre: 670 or 671. May be repeated.

Educational Psychology (Ed EP)

Professors ADKINS, R. ALM, BEYERS, COLLINS, FULLMER, LETON, RYAN, RYANS, STAATS; Associate Professors CHANG, DUNN-RANKIN, FUJITA, HAEHNLEN, NIYEKAWA-HOWARD, REID; Assistant Professors BHUSHAN, KENNEDY, KOZUMA, MCINTOSH, OWENS, TAKEGUCHI, WESTCOTT; Instructor KAGAN

311 and 416 or their equivalents are prerequisites for all graduate courses in Educational Psychology.

Students enrolled in colleges other than the College of Education are asked to confer with the department chairman before enrolling in 311.

- 311 Psychological Foundations (3) I, II**
Principles of learning and individual differences; relationships of these factors to classroom experience. Pre: Psy 100.
- 315 Arts and Crafts for Mentally Retarded (2) II** **Staff**
Construction and use of learning aids for mentally retarded children. May be taken concurrently with 406 with consent of instructor.
- 399 Directed Reading (arr.) I, II** **Staff**
Individual reading or research. Limited to senior majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in education. Pre: consent of instructor and department chairman.
- 404 Education of Exceptional Children (3) I** **McIntosh**
Survey of characteristics of children who deviate from average in mental, sensory, physical, social attributes; reviews adaptations made by schools to abilities and disabilities of exceptional children.
- 405 The Mentally Retarded (3) I** **Takeguchi**
Review of psychological, social, vocational problems related to mentally retarded children and their families.
- 406 Curriculum Development for Mentally Retarded Children (3) I** **Takeguchi**
Study of curriculum and materials used in education of mentally retarded children. Pre: 405.
- 408 The Emotionally Disturbed Child (3) I** **Staff**
Study of behavioral characteristics, methods of identification and management of emotionally disturbed children in regular and special classes in public schools, private day schools, clinics, residential schools, hospitals.
- 409 Culturally and Economically Disadvantaged Pupil (3) II** **Chang**
Survey of social and psychological factors related to culturally and economically disadvantaged pupil and his education. Review of local resources and facilities to assist these pupils. Pre: consent of instructor. (Identical with Ed EF 409.)
- 410 Curriculum Development for the Emotionally Disturbed (3) I**
Study of teaching methods and materials, techniques of curriculum development, methods of classroom organization and management used in education of emotionally disturbed children. Pre: 408.

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- 414 Education of Gifted Children (3) II** **Staff**
Characteristics and educational provisions for gifted children. Pre: 404.
- 416 Tests and Measurements (3) I, II** **Adkins**
Theory and techniques of measurement and evaluation in education, including supervised experience in instrument development and analysis.
- 429 Introductory Statistics (3) I** **Bhushan**
Introduction to statistical methods, with laboratory applications to educational and psychological data, especially scores on educational measurement devices and other indices of learning or behavioral change. Pre: one year of high school algebra or one college course in mathematics; consent of instructor; 311 and 416 desirable.
- 450 Practicum Experience with the Mentally Retarded (9) II** **Staff**
Observation and supervised student teaching with mentally retarded children at elementary and secondary levels. Includes 2-hour seminar each week. Pre: 405 and 406.
- 451 Practicum for Teachers of Emotionally Disturbed Children (9) II**
Classroom and clinical experiences to prepare teachers for work with children whose learning problems are associated with behavioral disorders. Pre: 408 or concurrent registration.
- 493-494 Senior Honors Thesis (2-2) Yr.** **Staff**
For seniors in Honors Program.
- 497 Introduction to Learning Disabilities (3) I** **Kagan**
Introduction to the education of learning-disabled children. A survey course covering mental, physical and academic characteristics of learning-disabled children and a discussion of their programming, adjustment and school placement. Pre: 404, 416.
- 601 Guidance in the School (3) I, II** **Fullmer**
Basic principles of guidance; consideration of techniques, organization, materials, resources.
- 602 Elementary School Guidance (3) I**
Principles, techniques, organization of guidance services in elementary school.
- 604 Occupational Information in Guidance (3) I** **Staff**
Occupational research and survey techniques; trends, sources of materials, use of occupational information in vocational guidance. Pre: 601.
- 605 Problems of School Adjustment (3) I** **Kennedy**
Principles of behavior affecting human relationships in school, with emphasis upon application to actual situations.
- 606 Student Personnel Services in Higher Education (3) II** **Haehnlen**
Philosophy, history, organization and administration of student personnel services at college and university levels including admissions, housing, student activities, financial aids, placement, counseling, health services.
- 608 Introduction to Educational Research (3) I, II** **Dunn-Rankin**
Fundamental design and evaluation procedures in educational research. Topics to include determining needs, defining objectives, research design, instrumentation, data collection, and evaluation. Pre: 416 or consent of instructor.
- 609 Tests and Inventories in Guidance (3) I, II** **Staff**
Tests and inventories for measuring aptitudes, interests, modes of behavior. Pre: 416, 601.
- 610 Counseling: Theory and Practice (3) I, II** **Fullmer**
Theories and techniques of counseling and psychotherapy as preparation for practicum and field work. Pre: 416 or equivalent course in tests and measurements, 601 or equivalent course in guidance, consent of instructor.
- 614 Theory and Assessment of Intelligence (3) I** **Leton**
Theories of intelligence, psychometric and social issues in intelligence testing; the use of individual intelligence examinations for the assessment of educability. Pre: 416 or Psy 425. Enrollment in graduate programs in clinical or school psychology, counseling and guidance or education of exceptional children.

- 615 Clinical Assessment of Exceptional Children (3) I** **Staff**
Diagnostic instruments used in clinical appraisal of exceptional children. Theoretical considerations will buttress field appraisal experience. Pre: 404, 416 and 429.
- 616 Seminar in the Education of Exceptional Children (3) II** **Staff**
Study of issues, research and program development in the following areas of special education: (1) mentally retarded, (2) emotionally disturbed, (3) learning disabilities. Pre: 9 credits from 404, 405, 406, 408, 409, 410, 615.
- 629 Educational Statistics (3) I, II** **Dunn-Rankin**
Statistical inference including applications of parametric and non-parametric methods to educational problems. Pre: 429 or equivalent.
- 640 Programmed Learning (3) II** **Reid**
Learning theory, experimental procedures and related systems, readings in study and development of programmed learning. Evaluation, selection, utilization of programs in classroom. Pre: 672 or consent of instructor. (Identical with Ed EC 640.)
- 645 American College Student (3) I** **Westcott**
Study of the psycho-social characteristics of the American college student and the college environment, from the viewpoint of student personnel work. Pre: 311, 416.
- 655 Learning, Language, and Intellectual Function (3) II**
Theory, research and method in study of language acquisition; function of language in intellectual activities; application to cognitive behavior modification. Pre: Psych 430. (Identical with Psychology 655.)
- 672 Advanced Educational Psychology: Learning (3) I, II** **Staats**
Application of experimental evidence in learning upon major educational problems; analysis of research methods in classroom learning. Pre: consent of instructor.
- 673 Advanced Educational Psychology: Psycho-Social Development (3) I** **Niyekawa-Howard**
Research methods and findings involving classroom group structures, attitude and personality development, psycholinguistic behavior. Pre: consent of instructor.
- 685 Children Learning Laboratory (3) I** **Staats**
Application of learning theory and procedures to individual and group work with children in controlled studies; basic to behavior modification procedures in clinical and educational psychology. Pre: consent of instructor. (Identical with Psy 685.)
- 699 Directed Reading and/or Research (arr.) I, II** **Staff**
Individual reading and/or research. Pre: consent of instructor and department chairman.
- 701 Seminar in Guidance (3) I, II** **Staff**
Current issues and problems. (1) School psychology, (2) testing, (3) counseling theory, (4) vocational, (5) elementary school, (6) administration, (7) group procedures, (8) philosophical and social issues in guidance. Pre: 8 credits in guidance courses; consent of instructor. May be repeated for credit.
- 702 Group Guidance (3) II** **Staff**
Principles, practices, materials, techniques used in group guidance in schools. Pre: 601.
- 703 Guidance Practicum (3) I, II** **Kozuma**
Supervised experience in guidance activities in schools. Guidance majors only. Pre: consent of instructor. May be repeated for credit.
- 708 Educational Research Methods (3) I, II** **Leton**
Research techniques and thesis development. Pre: 429 or equivalent; consent of instructor.
- 709 Advanced Problems of Educational Measurement and Evaluation (3) II** **Reid**
Theory of educational measurement and evaluation; analysis of educational tests and scales emphasizing statistical and psychological analysis of teacher-made and standardized tests and scales. Pre: 416, 429. (Identical with Psy 605.)

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- 710 Counseling: Group Theory and Practice (3) I, II** **Kozuma**
Theories and techniques of group counseling and psychotherapy as preparation for practicum and field work. Pre: 610 or equivalent preparation, basic course in guidance, tests and measurements, counseling theory-practice, and consent of instructor.
- 729 Scaling Qualitative Data (3) II** **Dunn-Rankin**
Theory and construction of major types of scales with examples from education, psychology, sociology. Pre: 429 or equivalent. (Identical with Psy 604.)
- 768 Seminar in Educational Psychology (3) I, II** **Staff**
Current issues and problems. (1) General, (2) learning, (3) measurement, (4) research and statistics, (5) psycho-social development. Pre: consent of instructor. May be repeated for credit.

Health and Physical Education (HPE)

Professor SAAKE; Associate Professors CHUI, GUSTUSON, O'BRIEN, VAN DEGRIFT, VASCONCELLOS; Assistant Professors ASATO, BEAMER, HANSON, LITTLE, ROCKER, SAKAMOTO, THOMPSON; Instructors KAINA, SEICHI

Medical Clearance Requirement: To register for the following courses, a student is required to present a medical clearance issued by Student Health Service: 101-163, 232-236, 333-337, 433, 434. Students without medical clearance will not be allowed to register in these courses.

- 101 Physical Fitness (1) I, II** **Gustuson, Thompson**
Conditioning exercises and activities to develop and maintain physical efficiency. Motor fitness tests administered to measure status and progress. Separate sections for men and women.
- 103 Swimming: Beginning (1) I, II** **Sakamoto**
Adjusting to and immersing in water, floating, sculling; correct arm stroke, leg kick, breathing techniques and their coordination.
- 104 Swimming: Intermediate (1) I, II** **Sakamoto, Seichi**
Perfecting and integrating basic strokes with added emphasis on swimming for distance and speed.
- 105 Swimming: Advanced (1) II** **Sakamoto**
Correct techniques used in competitive swimming, racing starts, correct turning techniques, long distance swimming.
- 107 Tennis: Beginning (1) I, II** **Asato, Rocker**
Rules, etiquette, grip, forehand and backhand strokes, serving, volleying; singles and doubles play.
- 108 Tennis: Advanced (1) II** **Staff**
Improving the serve, forehand and backhand strokes, volleying, chop shot, competitive strategy, problems in rules.
- 110 Golf: Beginning (1) I, II** **Vasconcellos, Staff**
Rules, etiquette, grip, stance, drive, normal iron shots, approach shots, putting.
- 111 Golf: Advanced (1) II** **Seichi**
Improving drive, fairway wood shots, long iron shots, control shots, trouble shots, putting, course management, competitive strategy, problems in rules. Green fees paid by students for play on courses.
- 115 Bowling (1) I, II** **Kaina, Staff**
Rules, etiquette, arm swing, approach, execution, scoring, spare pickups. Students pay charge for use of alley.
- 120 Badminton (1) I, II** **Rocker, Staff**
Rules, etiquette, grip, forehand and backhand strokes, serving, smash, drive, net play, offensive and defensive strategy; singles and doubles play.

- 123 Folk and National Dances (1) I** **Kaina**
Popular dances of various national groups, including square dances.
- 124 Dances of Hawaii (1) I, II** **Beamer, Kaina**
Background and fundamentals of hula. Selected dances with and without instruments.
- 126 Rhythmic Activities (1) I, II** **Kaina, Staff**
Social dances including ballroom dances, mixers, etc.
- 135 Volleyball (1) I, II** **Thompson, Seichi**
Rules, serving, passing, setting-up, spiking, blocking, offensive and defensive team play strategy. Separate sections for men and women.
- 137 Basketball (1) I, II** **Seichi, Thompson**
Rules, passing, shooting, dribbling, rebounding, individual defensive and offensive maneuvers, two- and three-man plays; team offense and defense. Separate sections for men and women.
- 151 Adapted and Prescribed Exercises (1) I, II** **Staff**
Small group and individual guidance and instruction for students recommended by Student Health Service.
- 152 Weight Training (1) I, II** **Gustuson, Staff**
Kinesiology of lifting and weight training, various types of exercises and methods of training with resistance.
- 154 Tumbling and Rebound Tumbling (1) I, II** **Gustuson**
Single and combination stunts on tumbling mats and trampoline, balancing stunts; techniques of spotting; safety procedures.
- 156 Heavy Apparatus (1) II** **Gustuson**
Single and combination stunts on side horse, horizontal bar, parallel bars, still rings; techniques of spotting; safety procedures.
- 160 Judo (1) I** **Staff**
Rules, etiquette, method of falling and breaking the fall, simple throws and their counters, simple holds and breaking of such holds, randori. (Student must provide own gi.)
- 161 Aikido (1) II** **Staff**
Rules, etiquette, basic rolls, simple holds and the breaking of such holds, specific physical conditioning exercises. (Student must provide own gi.)
- 162 Karate (1) II** **Staff**
Rules, etiquette, basic stances, blocks, thrusts, kicks, ippon kumite, and selected kata. (Student must provide own gi.)
- 163 T'ai Chi Ch'uan (1) I, II** **Pang**
Analytical and laboratory study of classic forms of T'ai Chi Ch'uan (advanced form of Kung Fu).
- 190 Modern Health: Personal (1) I, II** **O'Brien, Staff**
Mental-emotional health, family-living and scientific health information for personal hygienic living.
- 195 Modern Health: Personal and Community (2) I** **Van Degrift**
Primarily for majors in health education, physical education and recreation. Mental-emotional health, family-living and scientific health information for personal and community health.

Courses numbered 201 and above are not open to lower division students.

- 201 School Health Problems: Elementary (2) I, II** **O'Brien**
Responsibilities of elementary school teacher in recognizing and meeting pupils' needs, emphasizing teacher's role in health instruction, health services, school health policies.

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- 202 School Health Problems: Secondary (2) I, II** **Van Degrift**
Responsibilities of secondary school teacher in recognizing and meeting pupils' needs, emphasizing health instruction, health services, healthful school living, school health policies.
- 203 Introduction to Physical Education (2) I, II** **Thompson**
Aims and objectives of physical education; basic concepts of body in movement; physical education as academic discipline; relationship to related fields such as health education, recreation, athletics.
- 204 Introduction to Coaching Athletics (2) I, II** **Asato**
Nature, responsibilities, personal and professional requirements of coach. Scientific principles applicable to coaching methodology and athletic competition.
- 208 Introduction to Recreation (2) I, II** **Saake**
Aims, objectives, foundations of recreation, emphasizing historical analysis of forces and influences affecting recreation and leisure in modern society. Recreation as professional field.
- 231 Methods and Materials in Health Education (2) II** **O'Brien**
Organization and content, methods and materials for health teaching in elementary and secondary schools. Pre: 201 or 202.
- 232 Safety Procedures and Accident Prevention (2) I, II** **Seichi**
Understanding the fundamental principles and techniques of safety and accident prevention programming emphasizing school, home, public places, on the job and motor vehicle situations.
- 233 Physical Education: Elementary (3) I, II** **Hanson, Staff**
Content and methods for physical education in elementary school, emphasizing selection, planning, teaching, evaluation of movement exploration and physical activities.
- 235 Team Sports for Secondary Girls (2) II** **Kaina**
Fundamental skills, rules, strategy of team sports for secondary school girls. Hockey, soccer, speedball, basketball, volleyball, softball.
- 236 Team Sports for Secondary Boys (2) II** **Asato**
Fundamental skills, rules, strategy of team sports for secondary school boys. Touch football, soccer, basketball, volleyball, softball, water polo.
- 238 Outdoor Recreation (2) II** **Harada**
Objectives and values of outdoor recreation; characteristics and determinants of program; planning, organization, leadership and facilities for recreational uses of natural environment.
- 241 Health Education Curriculum (2) I** **O'Brien**
Objectives of school health program, emphasizing scope and sequence of health instruction; critical examination of health curriculum guides from various states: Pre: 201 or 202.
- 249 Social Recreation (2) I** **Kaina**
Objectives and values of social recreation; social club organization; selections, planning, conduct and evaluation of social activities; characteristics and responsibilities of leadership. Pre: 208.
- 271 Evaluation in Health Education (2) I** **Chui**
Processes involved in assessing school health education program with emphasis on measurement criteria and instruments, interpretation of data and content, organization and conduct of evaluation program. Pre: 201 or 202. (Alt. yrs; offered 1969-70.)
- 301 Health of the School Child (2) I** **Van Degrift**
Health problems of school child; role of school in meeting them, with emphasis on symptoms, causes, treatment. Pre: consent of instructor; 201 or 202 desirable.
- 302 School's Role in Community Health (2) II** **Staff**
Functional interrelationships between school and other community health organizations in solving community health problems. Pre: consent of instructor; 201 or 202 desirable. (Not offered 1969-70.)

- 328 Community Recreation (2) I** Saake
Organized community recreation; recreation and government; recreation and social institutions; industrial recreation; commercial recreation interests; special groups. Pre: 208 desirable.
- 329 Organization and Supervision of Recreation (2) II** Saake
Community organization, planning, personnel, areas and facilities, programs and services, finance and business procedures related to organized recreation. Pre: 208 and 208 desirable.
- 332 Practicum in Medical Self-Help Instructor Training (2) I, II** Seichi, Staff
Practicum in training of persons to become qualified instructors of medical self-help knowledge and skills. Red Cross first aid certificate may be earned. Pre: consent of instructor.
- 333 Coaching of Football and Basketball (2) I** Saake, Vasconcellos
Fundamentals, position play, team play, strategy, rules, scouting, planning and conduct of practice, specific training problems. Pre: 204.
- 334 Coaching of Baseball and Volleyball (2) II** Saake, Seichi
Fundamentals, position play, team play, strategy, rules, scouting, planning and conduct of practice, specific training problems. Pre: 204.
- 335 Coaching of Track and Field (2) II** Vasconcellos
Techniques and rules of sprints, distance runs, relays, hurdles, long jump, high jump, pole vault, shot put, discus and javelin throws; conduct of track and field meets; specific conditioning and training problems. Pre: 204.
- 336 Coaching of Swimming (2) II** Sakamoto
Techniques and rules of free style, breast-stroke, back-stroke, butterfly-stroke, relay racing, starting, turning, diving; conduct of swimming meet; specific conditioning and training problems. Pre: 204.
- 337 Coaching of Individual and Dual Sports (2) I** Saake, Seichi
Coaching and developing players for interscholastic teams in golf, tennis, bowling. Emphasis on rules, individual play under match conditions, dual or partnership strategy. Pre: 204.
- 338 Field Work in Recreation: Basic (arr.) I, II** Asato, Saake
Supervised leadership experience in recreational agencies. 1 hour per week in class discussion sessions. For recreation majors only. Pre: consent of recreation adviser. May be repeated once by consent of recreation adviser.
- 348 Programs in Recreation (2) I** Kaina
Factors in planning recreation programs; standard classification of recreation programs with critical analysis of nature, scope, materials, resources of each classification. Pre: 208 desirable.
- 399 Directed Reading (arr.) I, II** Thompson, Staff
Individual problems. Limited to senior majors in health education, physical education or recreation with 2.7 overall grade-point ratio in major field.
- 401 Current Trends in Health (3) II** O'Brien
Critical analysis of current problems and trends in basic health education areas which contribute to healthful living in community, home, school. Pre: 201 or 202; consent of instructor; 302 desirable.
- 423 Organization and Supervision of Physical Education (3) II** Asato, Beamer
Organization and supervision of physical education instructional, intramural, varsity athletic programs with emphasis on program content, policy and legal aspects, budget and finance, personnel, facilities and equipment, public relations, special problems. Pre: 203 and 233 desirable.
- 433 Music and Rhythms in Physical Education (2) I, II** Kaina
Use of music in physical education program, emphasizing selection of appropriate music for specific activities as expressive or creative movement, movement exploration, rhythmic gymnastics, dancing. Pre: consent of instructor; Mus 117 and 118 desirable.

434 Techniques of Officiating in Athletics (2) I

Seichi, Thompson

Techniques used by officials in selected sports, emphasizing general concepts of role of official and working knowledge of basic mechanics of officiating. Primarily for physical education and recreation majors. Separate sections for men and women.

438 Field Work in Recreation Internship (arr.) II

Staff

Supervised internship in recreational agencies. One hour per week in class discussion sessions. Limited to senior or graduate majors with 2.7 grade-point ratio in recreation. Pre: consent of recreation adviser. (Not offered 1969-70.)

453 Anatomy in Physical Education (3) II

Van Degriift

Gross human anatomy, emphasizing identification and description of parts of musculo-skeletal system; selected applications to motor activity. Primarily for physical education majors but open to others with consent of instructor. Pre: 1 yr. of biology or equivalent.

454 Physiology in Physical Education (3) I

Van Degriift

Emphasis on physiological responses to exercise and physical training as related to strength, muscular endurance, circulo-respiratory endurance. Primarily for physical education majors, but open to others with consent of instructor. Pre: 1 yr. of biology or equivalent.

463 Kinesiology (3) II

Little

Concepts and scientific principles essential to efficient human movement; proper application of kinesiological and mechanical principles to fundamental movements and selected complex motor skills. Pre: 453.

574 Assessment of Physical Fitness (3) II

Chui

Practicum for physical education teachers dealing with current methods and techniques by which physical fitness and related aspects of physical status assessed. Separate sections: (1) elementary school, (2) secondary school. Appropriate section must be designated at registration. Pre: teaching experience; consent of instructor.

603 Scientific Foundations of Physical Education (3) I, II

Chui

Scientific laws and principles relevant to man's physical and social environment as related specifically to physical fitness and human movement. Pre: 203, 453, 454 and 463, or consent of instructor.

623 Administrative Problems in Physical Education (3) II

Chui

Current problems and recent trends in conduct of physical education programs in educational settings. For administrators, teachers, graduate students in physical education and related fields. Pre: 423 or equivalent; consent of instructor. (Identical with Ed EA 623.)

634 Adapted Physical Education (3) II

Staff

Factors essential to practice of adapted physical education; disabilities, problems and needs of physically handicapped pupils with emphasis on accepted procedures for meeting these. Pre: 453, 454 and 463, or consent of instructor. (Not offered 1969-70.)

643 Public School Curriculum for Physical Education (3) I

Little

Detailed examination of contents of adequate curriculum for physical education in public schools, K-12. Pre: 203. Ed CI 343, Ed CI 636, or consent of instructor. (Identical with Ed CI 643.)

663 Mechanical Analysis of Sports Activities (3) II

Chui

Analysis of variety of sports activities in terms of applications of fundamental principles of mechanics with consideration to teaching and research. Pre: basic background in mathematics and physics; consent of instructor.

673 Evaluation and Measurements in Physical Education (3) I

Chui

Processes involved in assessment of physical education program with emphasis on measurement criteria and instruments, interpretation of data and content, organization and conduct of evaluation program. Pre: 203 or Ed EP 416, or consent of instructor.

699 Directed Reading and/or Research (arr.) I, II

Chui

Individual reading and/or research. Pre: consent of instructor and department chairman.

College of Engineering

PROFESSIONAL EDUCATION IN ENGINEERING has been a function of the University of Hawaii since its beginning in 1907. For the first fifty years of the institution civil engineering was the only engineering program offered, but in recent years other disciplines have been added. The curriculum in civil engineering was fully accredited by the Engineers' Council for Professional Development in 1951, electrical engineering in 1962, and mechanical engineering in 1967.

The program of study leading to an engineering degree provides a well-rounded university education designed to develop the general qualities of leadership and human understanding inherent to an educated person. In addition, it equips the engineering graduate with a sound theoretical background to meet the new and demanding problems of a rapidly expanding technology. Career opportunities in engineering, both in Hawaii and throughout the world, have never been brighter. The graduate of the engineering programs offered at the University of Hawaii is well-prepared to meet the challenges of our technology-oriented society.

Admission and Degree Requirements

General admission requirements of the University and recommended courses for prospective engineering students are listed on pp. 39-44. Additional screening of aptitude tests and high school records may be made for acceptance into the College of Engineering.

Many engineering students, both at the University of Hawaii and nationally, require more than eight semesters to receive an accredited engineering degree, even though all engineering curricula are listed in this catalog for completion on an eight-semester basis. Engineering students are encouraged to investigate the possibility of summer course work, particularly after the freshman and sophomore years, both for required courses and to satisfy the general education elective requirements.

In determining a student's draft status, the normal length of time for the completion of an engineering degree, established by the University and acceptable to the Selective Service System of the State of Hawaii, is four and one-half years. Therefore, an engineering student is eligible to qualify for a II-S deferment for the entire four and a half-year period, if he is satisfactorily pursuing a full-time course of study.

To receive the bachelor of science degree in engineering a student must:

1. Complete the course work for one of the engineering curricula, which also satisfies all University requirements;
2. have a 2.0 grade-point ratio for all registered credits;
3. have a 2.0 grade-point ratio for all upper division courses in the major department.

Curricula

The College of Engineering offers accredited undergraduate programs in civil, electrical, and mechanical engineering, as well as a business-oriented curriculum in general engineering. The course work in each of these programs provides a fundamental science-oriented university education with adequate coverage of communications, the humanities and social sciences; the basic physical sciences of mathematics, physics and chemistry; the engineering sciences common to all engineering disciplines, such as thermodynamics and electricity; and engineering elective courses which introduce the student to the engineering method of design.

All engineering freshmen enroll initially in the department of general engineering and are advised by engineering faculty from the beginning of their academic program. The first year is common to all four curricula and includes the following courses:

Common First Year

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
Eng 100 Expository Writing	3	English Elective or Sp 145	
*Math 205 (135) Calculus I	4	Expository Sp	3
†Chem 117 (108) Principles of Chem	4	Math 206 (136) Calculus II	4
Chem 118 (108) Principles of Chem Lab	1	Phys 170 General Physics	4
GE 107 World of Engineering	3	Phys 171 General Physics Lab I	
		‡GE 109 (105) Introd Design & Graphical Analysis	3
Total	15		15

At the beginning, or during, the sophomore year the engineering student selects the field of study in which he wishes to receive his degree, and pursues one of the curricula listed on the following four pages. The course work for each of these programs of study satisfies the general educational requirements of the University.

Those engineering students who are unusually well qualified academically are encouraged to participate in the Selected Studies and Honors Program. (See "Special Programs.") There is an honors coordinator for

* Math 134 may be required if math preparation is inadequate.

† If prerequisite for Chem 117 has not been met, 113-115 (103) and 114-116 (104) will be substituted.

‡ GE 61 is required of students who have not had one year of high school mechanical drawing.

the College of Engineering, who works with the faculty adviser of the honor student to assure that a challenging program of study is established. Upon recommendation of the coordinator, the honor student is allowed some flexibility in course selection from the curricula that follow.

Civil Engineering Curriculum

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
CE 211 (111) Surveying I	2	CE 212 (112) Surveying II	3
CE 270 (170) Applied Mechanics I	3	CE 271 Applied Mechanics II	3
Math 231 Advanced Calculus I	3	Math 232 Advanced Calculus II	3
Phys 272 (172) General Phys	3	Phys 274 (174) General Phys	3
Phys 273 (173) General Phys Lab	1	Hist 152 World Civilization	3
Hist 151 World Civilization	3		
Sp 145 Expository Speech or English Elective	3		
Total	18		15

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
CE 320 (220) Fluid Mechanics I	3	CE 322 (222) Fluid Mechanics II	3
CE 321 (221) Hydraulic Lab	1	CE 372 (274) Mechanics of Materials II	3
CE 371 (241) Mechanics of Materials Lab	1	CE 350 (351) Soil Mechanics	3
CE 370 (273) Mechanics of Materials I	4	ME 311 (231) Thermodynamics	3
EE 200 (102) Electrical Science	3	Elective (Human. or Soc. Sciences)	6
Elective (Human. or Soc. Sciences)	3		
Econ 120 Intro. to Econ.	3		
Total	18		18

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
CE 431 (331) Sanitary Engineering	3	GE 405 (301) Engineering Management	3
CE 461 (360) Transportation Engineering	3	CE Electives*	6 or 7
CE 485 (380) Structural Design I	4	Elective (Human. or Soc. Sciences)	3
CE 421 (321) Hydraulics or CE 481 (385) Structural Anal.	3	Elective†	3
Elective (Human. or Soc. Sciences)	3		
Total	16		15 or 16

* CE electives: CE 424 (325), 426 (326); or CE 486 (386), 482 (388); or CE 462 (362), 450 (364) and/or 467 (311). Science electives: approved by adviser.

† Consent of adviser.

Electrical Engineering Curriculum

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
CE 270 (170) Applied Mechanics I	3	CE 271 Applied Mechanics II	3
Math 231 Advanced Calculus I	3	Math 232 Advanced Calculus II	3
Phys 272 (172) General Physics	3	Phys 274 (174) General Physics	3
Phys 273 (173) General Physics Lab	1	Phys 275 (175) General Physics Lab	1
Hist 151 World Civilization	3	Hist 152 World Civilization	3
Sp 145 Expository Speech or English Elective	3	EE 311 (211) Circuit Theory	3
Total	16		16

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
EE 312 Circuit and System Analysis	3	EE 325 (221) Electronics I	3
EE 313 (223) Circuits Lab	1	EE 374 (232) Traveling Waves and Networks Laboratory	1
EE 371 (273) Fields and Waves I	3	EE 331 (351) Electro-mechanical Energy Conversion	3
Phys 440 Solid State Physics	3	EE 333 (353) Energy Lab	1
Econ 120 Introduction to Economics	3	EE 372 (373) Fields and Waves II	3
Elective*	3	ME 431 (460) Electronic Proc. in Materials or ME 371 (243) Mechanics of Solids	3
		Elective*	3
Total	16		17

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
EE 326 (321) Electronics II	3	ME 311 (231) Thermodynamics	3
EE 327 (323) Electronics Lab	1	Electives*	12
Electives*	12		15
Total	16		

* The 30 elective credits must satisfy University General Education requirements and must include 15 credits in technical electives (engineering, mathematics and physics courses 300 or above) of which at least 6 credits must be in EE.

General Engineering Curriculum**SECOND YEAR**

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
CE 211 (111) Surveying I	2	CE 271 Applied Mechanics II	3
CE 270 (170) Applied Mechanics I	3	Math 232 Advanced Calculus II	3
Hist 151 World Civilization	3	Phys 274 (174) General Physics	3
Math 231 Advanced Calculus I	3	Hist 152 World Civilization	3
Phys 272 (172) General Physics	3	Elective (Human. or Soc. Sciences)	3
Phys 273 (173) General Physics Lab	1		
Sp 145 Expository Speech or English Elective	3		
Total	18		15

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
CE 370 (273) Mechanics of Materials I	4	CE 320 (220) Fluid Mechanics I	3
CE 371 (241) Mechanics of Materials Lab	1	CE 321 (221) Hydraulics Lab	1
ME 311 (231) Thermodynamics	3	CE 372 (274) Mechanics of Materials II	3
Econ 120 Introduction to Econ.	3	EE 200 (102) Electrical Science	3
Elective (Human. or Social Sciences)	3	ME 312 (232) Applied Thermodynamics	3
		Mgt 300 Principles of Management	3
Total	14		16

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
ME 331 (366) Materials Science	3	EE 305 (203) Elect. Science Lab.	1
EE 304 (301) Elect. Circuits	3	Eng 310 (210) or 315 (215) or Technical Engineering Elect.	3
Elective (Human. or Soc. Sciences)	3	GE 405 (301) Engineering Management	3
Business Elective (see list below)	3	Elective (Human. or Soc. Sciences)	3
Business Elective (see list below)	3	Elective (Human. or Soc. Sciences)	3
		Business Elective (see list below)	3
Total	15		16

Business Electives: BEc 341 (340), BAS 302 (301), Mgt 321 (320), Mkt 300, Mgt 341 (340) or PIR 300 (350), LAW 300.

Mechanical Engineering Curriculum**SECOND YEAR**

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
CE 270 (170) Applied Mechanics I	3	CE 271 Applied Mechanics II	3
Math 231 Adv. Calculus I	3	Hist 152 World Civilization	3
Phys 272 (172) General Physics	3	Math 232 Adv. Calculus II	3
Phys 273 (173) General Physics Lab	1	Phys 274 (174) General Physics	3
Hist 151 World Civ.	3	Sp 145 Expository Speech or English Elective	3
Elective (Human. or Soc. Sciences)	3		
Total	16		15

THIRD YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
ME 311 (231) Thermodynamics	3	EE 200 Electrical Science	3
ME 321 (230) Mechanics of Fluids	3	ME 300 (234) Measurements Lab	2
ME 331 (366) Materials Science	3	ME 312 (232) Applied Thermodynamics	3
ME 371 (243) Mechanics of Solids	3	ME 341 (367) Materials Processing	3
Econ. 120 Intro. to Econ.	3	ME 375 (371) Intro. to System Dynamics	3
Elective (Human. or Soc. Sciences)	3	Elective (Human. or Soc. Sciences)	3
Total	18		17

FOURTH YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
EE 304 (301) Electronics Circuits	3	EE 305 (203) Electr. Science Lab	1
ME 400 (333) Mechanical Engr. Lab	2	ME 468 (374) Intro. to Engr. Design	4
ME 422 (475) Heat Transfer	3	Electives (Technical) *	9
ME 467 (373) Optimum Design of Mechanical Elements	3	Elective (Human. or Soc. Sciences)	3
Elective (Technical) *	3		
Elective (Human. or Soc. Sciences)	3		
Total	17		17

* Technical Electives: Any mathematics, physics or engineering courses numbered 300 or above approved by adviser; 6 credits must be ME courses.

OCEAN ENGINEERING

The University of Hawaii is one of the first schools in the United States to offer a degree in ocean engineering, which is defined as the application of engineering principles and techniques to the ocean environment. The current program is an interdisciplinary one at the Master of Science level, and involves the departments of oceanography as well as civil, electrical, and mechanical engineering. Graduate students in this program must have received a B.S. degree in engineering, or in a related science with engineering prerequisites. Specific information regarding ocean engineering and additional graduate activity to the doctoral level in other engineering disciplines may be found in the *University of Hawaii Graduate Division Bulletin*.

CENTER FOR ENGINEERING RESEARCH

The purpose of the Center for Engineering Research is to promote and coordinate research activity within the College of Engineering. Current areas of research interests are in structural engineering, water resources, coastal engineering, waste-water treatment and disposal, theoretical mechanics, heat transfer, information theory, microwaves and atmosphere ionization. The center cooperates with other University agencies such as the Hawaii Institute of Geophysics, the Water Resources Research Center and the Pacific Biomedical Research Center, to bring the full resources of the University to bear on multidisciplinary research projects.

The James Look Laboratory of Oceanographic Engineering is one of the major research facilities of the Center for Engineering Research. This facility is the first structure of the Kewalo Oceanographic Research Center, and permits research activity that has direct bearing on many ocean-related problems occurring throughout the state of Hawaii. A partial list of current and planned research with this facility includes the following: tsunami wave action on harbor installations; undersea structures; harbor pollution studies; beach erosion; smallcraft harbor design.

INFORMATION SCIENCES PROGRAM

The Information Sciences Program provides educational programs and encourages research in numerical and non-numerical information processing in cooperation with the University Computing Center. The program defines the interdisciplinary field of Information Sciences as the science of processing information by natural or artificial systems. It includes the theory and design of machines and systems; it includes computers and other information processing systems, such as communication systems and it includes simulation of these systems on machines.

Admission and Degree Requirements

The information sciences M.S. program is intended to serve both the student who is interested in a career in information sciences and the student who expects to use information sciences in another profession. Prospective students must present a baccalaureate degree, and although students from all fields will be accepted, students whose undergraduate field of study was not business, engineering, mathematics, or science should consult with the information sciences graduate student adviser before applying for admission. The minimum requirements for admission to the program are:

1. A working knowledge of some general programming language, such as FORTRAN, and
2. A year course in calculus, or a semester course in probability theory, or a semester course in logic.

Computing Facilities

The computing center at the University of Hawaii operates an IBM 360/65, and IBM 7040, and an IBM 1401. The 360/65 has a large capacity magnetic disk storage, seven IBM 2260 CRT alphanumeric consoles, a graphic console, and an IBM 1827 A-D converter. In October, 1967, a time-sharing system developed by the staff of the computing center became operational.

The ALOHA System

In September, 1968, the University began work on a project to provide radio-linked consoles and radio-linked satellite computers to the existing University time-shared computing system. This project, known as the ALOHA System, will make the full information processing capabilities of the central computing facility on the Manoa campus available to operating units of the University on the islands of Oahu, Hawaii, Maui, and Kauai. The ALOHA System is viewed as the first step in the construction of a satellite-linked computer net throughout the Pacific.

ENGINEERING COURSES

See pp. 4-5 for a discussion of course descriptions.

Civil Engineering (CE)

Professors CHIU, EVANS, GO, LAU, MITSUDA, TINNISWOOD, SZILARD; Associate Professors HAMADA, HASSELWOOD, MOH, WILLIAMS, YUEN; Assistant Professors GRACE, HUMMEL, TAOKA, YOUNG

211 Surveying I (2) I (1 L, 1 Lb)

Basic principles, computations, use of instruments involving horizontal and vertical measurements. Pre: trigonometry; GE 109.

212 Surveying II (3) II (2 L, 1 Lb)

Topographic mapping; curves; earthwork; computer applications; route problems. Pre: Math 205, CE 211 and GE 107 or GE 251.

270 Applied Mechanics I (3) I, II

Mitsuda

Equilibrium of particles, rigid bodies, frames and machines; vectors centroids, friction and moments of inertia. Pre: Phys 170.

271 Applied Mechanics II (3) I, II

Taoka

Dynamics of particles and rigid bodies; force acceleration, impulse-momentum, work-energy. Pre: 270, Math 206.

320 Fluid Mechanics I (3) I, II

Yuen

Properties of fluids, fluid statics, kinematics and kinetics; principles of momentum and energy; real fluid effects. Pre: 271 or Phys 310.

321 Hydraulics Laboratory (1) I, II

Grace

Experiments and demonstrations of fluid flow in open and closed conduits, fluid measurements and hydraulic machinery. Pre: credit or concurrent registration in 320.

322 Fluid Mechanics II (3) II

Grace, Yuen

Principles of ideal and real fluid flow applied to incompressible fluids with introduction to compressible fluid motion. Pre: 320.

350 Soil Mechanics (3) I, II (2 L, 1 Lb)

Evans, Hummel

Soil classification, elementary soil mechanics theory and practice. Pre: 370.

370 Mechanics of Materials I (4) I, II (3 L, 1 Lb)

Evans

Elastic stress-strain relationship and behavior of members under flexural, torsional, axial loading. Pre: 270.

371 Mechanics of Materials Laboratory (1) I, II (1 Lb)

Evans

Introduction to experimental techniques, observation of materials under various loading conditions. Pre: credit or concurrent registration in 370.

372 Mechanics of Materials II (3) II

Inelastic behavior, unsymmetrical bending, theories of failure, curved beams, torsion, energy methods, buckling. Pre: 370.

405 Engineering Management (3) I, II

Haselwood, Tinniswood

Business, legal, economic aspects of engineering. Pre: CE 370, ME 371 or EE 312.

411 Applied Probability and Statistics in Engineering (3) I

Grace

Basic concepts of probability and statistics; fitting data with named probability distributions; estimating statistical parameters; hypothesis testing; correlation and regression. Pre: consent of instructor.

421 Hydraulics (3) I

Yuen

Open channel flow emphasizing backwater curves, hydraulic jump, surges, flood-routing; pipe networks; surges, water hammer in hydro systems; pumps, turbines. Pre: 320.

- 424 Applied Hydrology (3) II** **Lau**
Introduction to occurrence, distribution, circulation of surface and ground water through precipitation, streamflow, evaporation, transpiration, infiltration. Engineering applications. Pre: 320 or equivalent.
- 426 Hydraulic Design (4) II (3 L, 1 Lb)** **Yuen**
Hydraulic design projects; feasibility studies; preliminary and detail design. Dams, canals, gates, energy dissipators and culverts. Pre: 421, 485 and credit or concurrent registration in 424.
- 431 Sanitary Engineering (3) I** **Tinniswood, Young**
Water resources. Fundamental aspects and design of water works. Pre: 320.
- 432 Sanitary Engineering (3) II** **Tinniswood, Young**
Pollution control. Fundamental aspects and design of wastewater works. Pre: 431 or consent of instructor.
- 450 Soils and Foundation Engineering (4) II (3 L, 1 Lb)** **Evans**
Application of soil mechanics to highways, airports, dams, foundations. Pre: 350.
- 461 Transportation Engineering (3) I** **Haselwood**
Introduction to the economics, administration, planning, design, and operation of transportation carriers, routes, terminals, and systems. Pre: senior standing in engineering, consent of instructor.
- 462 Advanced Transportation Engineering (3) II** **Haselwood**
Traffic engineering — the operation of open-guidance transportation systems. Pre: 461, consent of instructor.
- 467 Photogrammetry (3) II**
Basic principles; photographic equipment; control, method of compilation; mosaics. Pre: consent of instructor.
- *471 Advanced Dynamics (3) I**
Particle motion in three dimensions. Motion of system of particles and of rigid body. Euler's equations, generalized coordinates, Lagrange's equations. Pre: 271, Math 232, consent of instructor.
- 481 Structural Analysis (3) I** **Hamada**
Plane frameworks, graphical methods, influence lines, deflection and stress analysis of structures by classical methods. Pre: 370.
- 482 Advanced Structural Analysis (3) II** **Chiu, Hamada**
Analysis of indeterminate beams, rigid frames, trusses, arches and space frames by classical methods, moment distribution, introduction to matrix analysis. Pre: 481.
- 485 Structural Design I (4) I (3 L, 1 Lb)** **Moh**
Design of elements of steel and reinforced concrete structures, with emphasis on ultimate strength theory. Pre: 370.
- 486 Structural Design II (4) II (3 L, 1 Lb)** **Moh**
Continuation of 485. Design of structural systems in timber, steel and reinforced concrete, introduction of prestressed concrete design. Design project. Pre: 485 and credit or concurrent registration in 482.
- *487 Prestressed Concrete (3) I, II** **Go**
Analysis and design of prestressed beams, columns, slabs, composite sections. Special problems. Pre: 486 or equivalent, consent of instructor.
- 499 Special Problems (arr.) I, II**
Individual investigation in civil engineering topics as approved by instructor. Limited to seniors with 2.7 overall grade-point ratio, or 3.0 grade-point ratio in engineering.
- 621 Advanced Fluid Mechanics I (3) I** **Williams**
Mechanics of ideal fluid, potential flow, conformal mapping, vortex motion, deep and shallow water wave theory, introduction to gas dynamics. Pre: Math 232, CE 322 or consent of instructor.

* May apply toward graduate program. See Graduate Division rules.

- 622 Advanced Fluid Mechanics II (3) II** **Williams**
 Mechanics of a real fluid, boundary layer and turbulence theory, drag, diffusion and other topics of advanced fluid mechanics. Pre: Math 232, CE 322 or consent of instructor.
- 624 Flow in Porous Media (3) II** **Lau, Williams**
 Applications of fluid mechanics to flow of single-phase and multi-phase fluids in porous media. Pre: consent of instructor.
- 626 Surface-Water Hydrology (3) II** **Lau**
 Quantitative studies of water cycle and relationships among principal hydrologic elements: precipitation, runoff, infiltration and evapotranspiration with emphasis on engineering and management of surface-waters. Pre: consent of instructor.
- 627 Ground-Water Hydrology (3) I** **Lau**
 Ground-water occurrence, movement, quality, conservation, development, management. Hydromechanics of ground-water. Pre: consent of instructor.
- 631 Environmental and Sanitary Engineering Theory I (3) I** **Young**
 Study of principles and unit processes involved in water and air resources problems, including water sources purification principles, distribution, air pollution control. Pre: consent of instructor.
- 632 Environmental and Sanitary Engineering Theory II (3) II** **Young**
 Principles of waste water and solids waste handling, treatment and re-use, study of factors involved in disposal of waste to natural waters. Pre: 631.
- 633 Environmental and Sanitary Engineering Design I (3) I (1 L, 2 Lb)** **Burbank**
 Functional design of modern water and air purification systems. Pre: consent of instructor.
- 634 Environmental and Sanitary Engineering Design II (3) II (1 L, 2 Lb)** **Burbank**
 Functional design of modern waste water and solids waste treatment systems. Pre: 633.
- 635 Environmental and Sanitary Engineering Chemistry**
(4) I (2 L, 2 Lb) **Young**
 Chemistry of water, waste waters and air, including instrumentation and process control evaluations and interpretations of results as used in practice. Pre: consent of instructor.
- 636 Environmental and Sanitary Engineering Microbiology (4) (2 L, 2 Lb)**
 Fundamental microbiology involved in environmental engineering processes and research with special emphasis on mixed culture systems, biochemistry, physiological chemistry. Pre: consent of instructor.
- 637 Environmental and Sanitary Engineering Lab (3) II (2 L, 1 Lb)** **Young**
 Studies of chemistry and physics of various unit processes in waste water and solids waste treatment, including laboratory work necessary for development of design criteria and operation and control of these systems. Pre: consent of instructor.
- 638 Environmental and Sanitary Engineering Public Health (3) II** **Burbank**
 Characteristics of diseases, means of transmission and means of prevention through control of environment with special emphasis on public health administration, biostatistics, insect and rodent control, industrial hygiene. Pre: consent of instructor.
- 651 Soil Mechanics (3) II** **Evans**
 Theories of soil resistance, seepage, consolidation settlement analysis, bearing capacity, stability considerations. Pre: consent of instructor.
- 655 Applied Soil Mechanics I (3) I (2 L, 1 Lb)** **Evans**
 Foundation and stability analysis of retaining walls, footings, piles, load tests on footing and piles, mass stability, compilations and analysis of test data. Pre: 651 or consent of instructor.
- 656 Applied Soil Mechanics II (3) II (2 L, 1 Lb)** **Evans**
 Continuation of 655 to include seepage settlement, mass stability, sheet piling and tunnels. Pre: 655.

671 Theory of Elasticity I (3) I**Szilard**

Classical and tensor approaches to stress-strain and strain-displacement relationships. Differential equations of equilibrium and compatibility. Plane stress and torsion problems using classical and variational methods. Pre: consent of instructor.

672 Theory of Elasticity II (3) II

Stress, strain and elasticity relations in indicial notation. Solution of two and three dimensional problems by complex variables, potential functions and transform methods. Special topics. Pre: 671.

673 Theory of Plasticity (3) II**Mitsuda**

Inelastic stress-strain relationships. Yield condition and flow laws. Time-independent and time-dependent inelastic behavior. Limit analysis of members and structures. Pre: 671.

674 Stability of Structures (3) II**Stuiver**

Elastic and inelastic buckling of columns. Lateral buckling of beams. Stability of frameworks and elastically supported columns. Pre: consent of instructor.

675 Theory of Vibrations (3) I**Taoka**

Principal modes and natural frequencies of discrete and continuous elastic systems. Approximate methods. Forced motions, damping effects, wave propagation. Pre: consent of instructor.

676 Structural Dynamics (3) II**Moh**

Dynamic disturbances, free and forced vibration of structures with single-degree and multi-degree of freedom, elastic and inelastic beams, response of structures to dynamic loading. Pre: 675.

677 Energy Methods in Applied Mechanics (3) II**Taoka**

Variational principles of mechanics and their application to engineering problems. Virtual work, minimum potential energy, minimum complementary energy. Applications to structures, solid mechanics. Pre: 671.

678 Theory of Plates (3) I**Szilard**

Governing differential equations of static and dynamic plate problems. Classical and approximate methods. Conventional and improved finite difference methods. Matrix displacement method using finite elements. Elastic buckling. Yield line theory. Pre: consent of instructor.

679 Theory of Thin Shells (3) II**Szilard**

Membrane and bending theories of rotational shells. General membrane theory. Bending theory of shallow shells. Classical and approximate methods. Free and forced vibrations. Finite difference and finite element methods. Elastic stability. Pre: consent of instructor.

681 Advanced Indeterminate Structures (3) I**Chiu**

Energy methods, elastic center, column analogy, indeterminate trusses, arches, influence lines, elements of matrix analysis, introduction to plastic theory. Pre: consent of instructor.

682 Numerical Methods of Structural Analysis (3) II**Chiu**

Finite difference, numerical integration, relaxation and matrix methods applied to analysis of structural systems. Computer applications. Pre: 681.

683 Advanced Reinforced Concrete Design I (3) I**Go**

Ultimate strength theory, composite beams using precast and cast-in-place concrete, rigid frames and slabs. Pre: consent of instructor.

684 Advanced Reinforced Concrete Design II (3) II**Go**

Continuation of 683. Spherical, cylindrical and hyperbolic paraboloid shells, circular and rectangular tanks, folded plates structures. Pre: 683.

685 Plastic Analysis of Metal Structures (3) I**Moh**

Theory of limit design. Plastic behavior of structural materials, principles of upper and lower bound, statical method, mechanism method and semi-graphical method. Analysis of continuous beams, rigid frames, multi-story structures. Pre: 681.

696 Selected Topics in Civil Engineering (3) I or II

Highly specialized topics in structural, soils, hydraulics, sanitary, ocean engineering. Pre: consent of instructor.

697-698 Seminar in Civil Engineering (1-1) Yr.

Discussions and reports on literature, research, developments, and activities in one of these areas: (1) structural engineering; (2) environmental and sanitary engineering; (3) soil and foundation engineering; (4) hydraulic engineering. Pre: consent of instructor. Required of all graduate students.

699 Directed Reading or Research (arr.) I, II

Pre: consent of instructor.

800 Thesis Research (arr.)**Electrical Engineering (EE)**

Professors ABRAMSON, HWANG, KINARIWALA, KUO, PETERSON, YUEN; Associate Professors GRANBORG, ROELOFS, WEAVER, WELDON; Assistant Professors CHATTOPADHYAY, FANG, LIN, NAJITA

200 Electrical Science (3) I, II (3 L)

Introduction to electrical science, fields, circuits and electronics. Pre: Phys 272, Math 231, and concurrent registration in Math 232.

304 Electronics Circuits (3) I (3 L)

Analysis and synthesis of electrical networks and systems. For non-electrical engineers. Pre: 200.

305 Electrical Science Laboratory (1) II (1 Lb)

Application of electric and magnetic field concepts to circuits, machines, electronics. For non-electrical engineers. Pre: registration in 304.

307-308 Computer and Information Sciences (3) I, II

Abramson

Introduction to computers and computer programming. Elementary information theory and coding. Applications to linguistics, music, economics and the social sciences. Experimental work in the synthesis of codes using the IBM 360/65 will be required. Not intended for the information sciences or engineering major. Pre: high school algebra. (Identical to ISC 301-302.)

311 Circuit Theory (3) I, II (3 L)

Kinariwala

Analysis of electrical circuits. Transform methods. Topology. Pre: Phys 272; Math 231.

312 Circuit and System Analysis (3) I, II (3 L)

Kuo

Laplace transform, s-plane analysis, transfer functions, Fourier analysis, sampling and correlation. Pre: 311; Math 232.

313 Circuits Laboratory (1) I, II (1 Lb)

Najita

Laboratory for 312. Pre: 311.

325 Electronics I (3) I, II (3 L)

Fang, Roelofs

Study of properties of electron tubes and semiconductor devices and their application as circuit elements. Pre: 311.

326 Electronics II (3) I, II (3 L)

Fang, Roelofs

Theory and design of oscillators, waveforming circuits, modulators, demodulators, logic circuits. Instrumentation. Pre: 325.

327 Electronics Laboratory (1) I, II (1 Lb)

Fang, Roelofs

Laboratory for 326. Pre: 374; registration in 326.

331 Electromechanical Energy Conversion (3) II (3 L)

Hwang

Application of electric and magnetic field principles to energy flow between electrical and mechanical systems. A.c. and d.c. machines. Transformers. Pre: 311, 371.

- 333 Electromechanical Energy Conversion Laboratory (1) II (1 Lb)** **Hwang**
Experiments on electromechanical energy conversion using generalized machine. Pre: 313; registration in 331.
- 371 Fields and Waves I (3) I, II (3 L)** **Weaver, Yuen**
Stationary and traveling waves in distributed-parameter systems. Stationary electric and magnetic fields. Pre: 311; registration in Math 232.
- 372 Fields and Waves II (3) I, II (3 L)** **Weaver, Yuen**
Solution of Maxwell's equations under various boundary conditions. Introduction to microwave theory. Pre: 371.
- 374 Traveling Waves and Networks Laboratory (1) I, II (1 Lb)** **Fang, Roelofs**
Experiments on properties of linear active networks and distributed-parameter systems. Pre: 313; registration in 325, 372.
- 396 Project (2) I, II**
Investigation of advanced engineering problems. Pre: senior standing.
- 399 Special Problems (arr.) I, II**
Research or development problem. Pre: senior standing with 3.0 grade-point ratio in major field.
- 411 Introduction to System Analysis (3) I (3 L)** **Chattopadhyay**
Basic characteristics and mathematical models of physical systems. Energy space approach to system representation. Impulse response and its relation to energy space representation. Stability of systems. Observability and identification of systems. Attainable regions and other related concepts. Pre: 312; Math 232.
- 422 Electronic Instrumentation (3) II (3 L)**
Basic transducers and signal processing amplifiers for electronic control and measurements. Data acquisition and transmission circuits. Analog and digital circuits. Pre: 312, 325.
- 423 Instrumentation Laboratory (1) II (1 Lb)**
Laboratory for 422. Pre: 313; registration in 422.
- 425 Electronics III (3) I (3 L)** **Roelofs**
Characteristics and analysis of integrated circuits. Fabrication methods for resistors, capacitors, diodes and active circuits. Application of linear and non-linear integrated circuits in practical systems. Pre: 325.
- 427 Topics in Physical Electronics (3) II (3 L)** **Fang**
Fundamental physical principles underlying phenomena and devices based on controlled motion of electric charges in solids and gases. Influence of applied electromagnetic fields, space charge, collisions and velocity distributions on motion of charge carriers. Bulk phenomena and surface effects. Transport of charges across semiconductor junctions, across metal-vacuum boundaries, through insulating layers, in gaseous plasma. Devices based on these effects. Integrated microelectronic devices. Pre: Phys 440 or consent of instructor.
- 435 Power System Analysis (3) I (3 L)** **Hwang**
Characteristics of transmission systems. Generalized circuit constants and circle diagrams. Matrix representation of power systems. Load flow studies. Synchronous machines. Balanced and unbalanced operation. Stability. Pre: 331.
- 436 Direct Energy Conversion (3) I (3 L)** **Hwang**
Principles of energy conversion. Thermoelectric and thermionic generators. Photo-voltaic effect and solar cells. Magnetohydrodynamic power generators. Free energy and the fuel cell. Pre: 303 or 331; ME 311.
- 441 Principles of Communications (3) I, II (3 L)** **Lin, Peterson**
Signal representation, modulation, communication systems, noise. Introduction to information theory. Pre: registration in 325.
- 446 Information Theory and Coding (3) I, II (3 L)** **Lin, Weldon**
Fundamental properties of information. Sources and channels and coding of information. Applications to communication, linguistics, and other fields. Method of study based on elementary probability theory, but emphasis on significance of results. Open to all students. Pre: Math 134; junior standing or consent of instructor. (Identical to ISC 446)

451 Feedback Control Systems (3) I, II (3 L)**Granborg, Hwang**

Principles of linear feedback control systems with emphasis on methods, analysis and synthesis to meet prescribed performance criteria. Electronic, electromechanical, electrohydraulic components; stability criteria; root, locus. Nyquist and Bode techniques; cascade and feedback compensation of control system. Pre: 311.

452 Feedback Control Systems Laboratory (1) I, II (1 Lb)**Granborg**

Laboratory for 451. Pre: 313, registration in 451.

461 Digital Techniques (3) I, II (3 L)**Kuo, Weldon**

Number systems, Boolean algebra and combinational digital circuits. Logical design. Sequential circuits. Machine language instructions. Organization of simple computer. Pre: junior standing or consent of instructor. (Identical to ISC 461)

462 Digital Techniques Laboratory (1) I, II (1 Lb)**Weldon**

Laboratory for 461. Pre: registration in 461.

463 Analog Computers (3) II (3 L)**Granborg**

Concepts and principles of analog computation. Scaling and programming linear, non-linear, and time-varying differential equations; direct simulation of electrical and mechanical systems. Pre: junior standing or consent of instructor.

466 Computer Organization and Programming Techniques (3) II (3 L)**Peterson**

Organization and machine language of typical computers. Machine language programming techniques. Introduction to operating systems. Introduction to data structures, sorting, retrieving data from files of information. Pre: knowledge of FORTRAN programming or consent of instructor. (Identical to ISC 466)

467 Algorithmic Languages (3) I (3 L)**Peterson**

Introduction to algorithms, languages for describing them, associated programming techniques. Commonly used languages for numerical and non-numerical computation. Pre: knowledge of FORTRAN programming or consent of instructor. (Identical to ISC 467)

473 Microwave Theory and Techniques (3) I (3 L)**Yuen**

Theory and techniques of energy generation and transmission at microwave frequencies. Principles of operation of microwave tubes, devices, systems. Pre: 325, 372.

475 Radio-Wave Propagation (3) I (3 L)**Weaver**

Application of Maxwell's equations to study of radio-wave propagation in free space and ionized media. Study of formation and maintenance of earth's ionosphere. Geomagnetic and solar effects. Absorption and dispersion. Measurement techniques. Pre: 372.

491-492 Special Topics in Electrical Engineering (3-3) I, II (3 L)

Course content will reflect special interests of visiting and permanent faculty, and will be oriented toward juniors and seniors. Pre: consent of instructor.

495-496 Special Topics Laboratory (1-1) I, II (1 Lb)

Lab for 491-492. Pre: consent of instructor.

611-612 Network Synthesis (3-3) Yr. (3 L)**Kinariwala**

Properties of driving-point and transfer immittances, lossless and lossy. Approximation techniques. Transfer function synthesis and techniques using active elements. Pre: 312 or equivalent.

613 Linear System Analysis (3) I (3 L)**Kuo, Lin**

Discussion of fundamental concepts. Study of linear graphs, network equations and computational algorithms in linear algebra. Use of state-space methods, Fourier transforms, generalized functions. Study of random signals in linear systems. Pre: 312 or equivalent. (Identical to ISC 613)

614 Analysis of Nonlinear Systems (3) II (3 L)**Hwang**

Properties of stability, singular points, limit cycles. Analysis techniques. Realizability of solutions. Pre: 326, 451; Math 232 or equivalent.

616 System Theory (3) II (3 L)

Representation theory of linear operators and functionals. Short review of state space representation. Variational approach to state space theory, canonical representation of systems, irreducible systems, system identification, infinite dimensional state spaces. Pre: 411 or 451 or equivalent.

618 System Optimization (3) II (3 L)

Mathematical foundations of system optimization. Variational approach. Geometry of optimal processes. Linear and nonlinear programming. Dynamic programming. Pre: 613 or equivalent.

623 Advanced Electronic Instrumentation (3) I (3 L)

Electronic conversion transducers for control and measurements: special-purpose amplifiers; analog and digital components and circuits; applications. Pre: 422 or equivalent.

627 Advanced Topics in Physical Electronics (3) I (3 L)

Fang

Recent developments in phenomena and devices of physical electronics. Pre: 427.

645 Introduction to Linear Systems and Noise (3) I (3 L)

Linear systems, state space, time and amplitude discrete systems. Fourier methods. Random processes, their autocorrelations and spectral densities. Linear transformations of random processes. Gaussian random process.

646 Signal and Noise Theory (3) II (3 L)

Envelope and phase statistics of Gaussian random process. Finite time measurements of random processes. Spectral estimates. Modulation theory. Non-linear transformations of random processes. The Karhunen-Loeve expansion. Pre: 613 or equivalent.

647 Applied Statistical Decision Theory (3) II (3 L)

Abramson

Random signals and noise; data processing and statistical decision theory. Detecting signals in presence of noise; applications to problems in communications, radar and radio astronomy. Signal processing in two dimensions with applications to tsunami detection and filtering of seismic signals. Adaptive decision making and pattern recognition. Pre: 613 or equivalent.

648 Error-Correcting Codes (3) II (3 L)

Lin, Weldon

Basic mathematical properties of block and convolutional codes, cyclic codes, correction of random and burst errors, implementation, use in practical error control systems. Pre: Math 311 or consent of instructor.

649 Error-Correcting Codes II (3) I (3 L)

Lin, Weldon

Majority logic decoding, codes based on Euclidean and projective geometries, polynomial codes, concatenated codes, advanced topics on cyclic codes, quasi-cyclic codes, non-linear codes, convolutional codes and related decoding procedures, sequential decoding. Current research problems. Pre: 648.

651 Advanced Feedback Control Systems (3) I (3 L)

Analytical and numerical methods for investigation and solution of non-linear control systems, derivation of z-forms, the phase plane, describing function techniques, relay systems, sampled-data systems, non-linear compensation techniques, adaptive control systems. Pre: 451 or equivalent.

652 Optimization Techniques in Control Systems (3) II (3 L)

State-space concepts, solution of matrix-differential equations, state vectors and fundamental matrix, development of maximum principle, minimum time and minimum energy problem, generalized performance criteria, effects of inaccuracies of components, optimum design of adaptive control. Pre: 451 or equivalent.

653 Adaptive Control (3) I (3 L)

Chattopadhyay

Control in a variable environment; definition of performance criteria; plant identification; time-variant control parameters; logical control processes; basic optimization processes; pertinent analog and digital control techniques; introduction to linear and dynamic programming for control; multi-dimensional control processes. Pre: 451 or consent of instructor.

654 Concepts of Digital System Control (3) I (3 L)

Characteristics of digitized control signals; digital control components; organization, design, evaluation of digital control systems; command and interelement communica-

tion; transducers; error detection and loop compensation; actuation; reliability enhancement; automated design methodology. Pre: 451 or equivalent.

655 Sampled-Data Control Systems (3) I (3 L)

Granborg

Theory and application of sampled-data control systems; sampling and filtering theorems, z-transforms, modified z-transforms, digital compensation and stability, optimization, application of state variable theory to sampled-data systems, on-line digital computer systems. Pre: 451 or equivalent.

656 Concepts of Systems Engineering (3) II (3 L)

Organization of large systems; system phases and evolution; planning; reliability and maintainability; system evaluation; trade-off and cost-effectiveness; concepts task automation; typical large systems. Pre: 654 or consent of instructor.

657 Hybrid Automatic Control Systems (3) II (3 L)

Granborg

System components of hybrid computers. Automatic control system simulation, multi-point boundary-value problems, linear programming optimization problems and partial differential equations. Analog, digital and hybrid systems in process control. Pre: 451 or consent of instructor.

661 Theory of Digital Machines (3) I (3 L)

Peterson

Introduction to sequential switching circuit theory, theory of automata, and to mathematical theory of linguistics as it applies to automata. Pre: 461 or consent of instructor. (Identical to ISC 661)

671-672 Electromagnetic Theory and Applications (3-3) Yr. (3 L)

Najita

Solutions and applications of Maxwell's equations to radiation and propagation of electromagnetic waves. Pre: 372 or equivalent; Math 232 or equivalent.

673 Magneto-Ionic Theory (3) II (3 L)

Weaver

Electromagnetic waves in ionized medium with superimposed magnetic field. Applications. Pre: 475.

675-676 Advanced Microwave Theory (3-3) Yr. (3 L)

Yuen

Advanced topics in microwave theory. Pre: 473.

677 Antenna Theory (3) I (3 L)

Roelefs

Principles of radiation; point sources and arrays; dipole and thin linear antennas; self- and mutual-impedances; antennas for LF, HF, VHF, UHF and microwave frequencies. Pre: 372 or equivalent.

693 Special Topics in Electrical Engineering (3) I, II (3 L)

Course content will reflect special interests of visiting and permanent faculty. Pre: consent of instructor.

697-698 Seminar in Electrical Engineering (1-1) Yr.

Pre: graduate standing, consent of instructor.

699 Directed Reading or Research (arr.) I, II

Pre: graduate standing, consent of instructor.

800 Thesis Research (arr.) I, II

Pre: candidacy for M.S. or Ph.D. in E.E.

General Engineering (GE)

Associate Professor AVERY; Instructors DRAKE, POWELL, STOUTEMYER, TAN

61 Graphical Communication (1) I (2 Lb)

Drake

Orthographic and pictorial instrument drawing and sketching, dimensioning, auxiliary and section views. Intended for engineering students who have not had 1 year of high school mechanical drawing.

107 The World of Engineering (3) I, II (2 L, 1 Lb)

Avery, Drake, Powell, Stoutemyer

Introduction to engineering: nature of its goals and techniques including computer programming. Pre: registration or credit in Math 205.

MECHANICAL ENGINEERING

109 Introductory Design and Graphical Analysis

(3) I, II (1 L, 2 Lb)

Avery, Drake, Powell, Stoutemyer, Tan

Use of graphical techniques for analysis of engineering problems: design project emphasizing creativity and presentation. Pre: 1 year of high school drawing or GE 61.

251 Digital Computer Programming (2) I, II

Drake, Powell, Stoutemyer, Tan

Introductory computer programming for applied mathematics and physical science applications. Intended for students who have not taken 107. Pre: Math 134.

301 Architectural Structures "A" (3) II

Powell

Structure in architecture, introduction to basic mechanics and strength of materials. Pre: Math 205. (Identical with Arch 301.)

302 Architectural Structures "B" (3) I

Powell

Mechanics and strength of materials. Design of simple beams, columns and trusses in various materials. Pre: 301. (Identical with Arch 302.)

451 Numerical Programming Applications (3) II (3 L)

Stoutemyer

Modeling, numerical and digital computer analysis of fluid, electrical, thermal, mechanical and interdisciplinary systems. Emphasis on general techniques applicable to non-linear problems with irregular geometry. Pre: 107 or 251, Math 232 or equivalent, and consent of instructor.

Mechanical Engineering (ME)

Professors BURGESS, FAND, STUIVER; Associate Professors CHOU, LARSEN-BADSE, MUNCHMEYER; Assistant Professors FOX, HTUN, JOHNSON, KIHARA

300 Measurements Laboratory (2) II

Techniques of engineering measurements. Methods, instruments, computation and procedures. Applications to typical problems. Pre: junior standing in ME.

311 Thermodynamics (3) I, II

Basic laws. Work, heat, concept of entropy. Perfect gases, mixtures. Availability, irreversibility, efficiency. Pre: Phys 170.

312 Applied Thermodynamics (3) II

Thermodynamic principles of reciprocating machines, turbomachinery, jet propulsion. Power and refrigeration cycles. Combustion. Pre: 311.

321 Mechanics of Fluids (3) I

Incompressible and compressible ideal fluids, effects of viscosity. Similitude, boundary layer flow, elementary gas dynamics. Pre: Phys 170.

331 Materials Science (3) I

Htun, Larsen-Badse

Behavior of materials as determined by structure and environment. Interrelationships between microscopic and macroscopic structure and phenomenological properties. Pre: Phy 274 (174).

341 Materials Processing (3) II (2 L, 1 Lb)

Htun

Development, processing, fabrication of engineering materials. Energy requirements of various manufacturing methods and their effect upon material properties. Pre: 331 (366).

371 Mechanics of Solids (3) I, II

Johnson

Analysis of deformable bodies. Definition of stress and infinitesimal strain. Linear elasticity. Stress, strain and deformation of simple bodies subjected to torsion, bending, and shear force.

375 Introduction to System Dynamics (3) II

Burgess, Stuiver

Linear and non-linear modeling of discrete physical elements in dynamic systems. Formulation and solution of governing differential equations by direct (classical) analysis. Transient and steady state response of first and second order single-degree-of-freedom systems. Pre: CE 271, Math 232.

400 Mechanical Engineering Laboratory (2) I**Munchmeyer**

Performance analysis and testing of machines, engines, systems. Experiments in automatic control. Special projects. Pre: 300 (234).

417 Thermal Environmental Engineering (3) II**Chou**

Refrigeration processes, psychrometrics, solar radiation. Applications to air conditioning design. Physiological aspects of survival. Pre: 312 (232).

418 Turbomachinery (3) I

Theoretical analysis of energy transfer between fluid and rotor; principles, performance, design of compressors and turbines. Pre: 312 (232).

419 Power Plants (3) I**Chou**

Steam generators, prime movers, piping design, plant economy. Solar energy. Introduction to non-electromechanical energy conversion. Pre: 312 (232).

422 Heat Transfer (3) I**Fand, Fox**

Steady and transient conduction. Fundamentals of radiation and convection. Heat exchangers. Pre: 311 (231), Math 232.

424 Introduction to Gasdynamics (3) II**Kihara**

One-dimensional compressible flow involving change of area, normal shock, friction, heat transfer. Pre: 312 (232), 321 (230).

431 Electronic Processes in Materials (3) II**Larsen-Badse**

Physical basis of electric, magnetic, optical properties of solids. Effects arising from material and processing variables and from impurities, imperfections, domains, grain boundaries. Pre: 331 (366) or Phys 440.

433 Failures in Materials (3) II**Htun**

Imperfections. Fatigue. Fracture. Wear. Uniform, galvanic, fretting, cavitation, stress and high temperature corrosion. Bending, tensile and impact failures. Surface spalling, pitting, cracking. Selection of materials. Pre: 331 or consent of instructor.

441 Thermal Material Processing (3) II**Htun**

Liquid state, nucleation phenomena, solidification mechanism. Cast alloys and casting methods. Heat treating, ausforming, welding, brazing, soldering, adhesive bonding. Forgings, powder metallurgy. Plastics. Pre: 341 or consent of instructor.

451 Automatic Control (3) I**Burgess, Stuiiver**

Transient response of electro-mechanical systems with emphasis on the effects of feedback. Transfer functions and their determination by Laplace transform methods. Analysis of transient response using pole-zero maps. Use of Routh's method and the root-locus method for stability analysis. Frequency response methods; Bode charts. Comparison of pole-zero and frequency response methods; application to design of control systems. Pre: 375.

455 Nuclear Power Engineering (3) I**Kihara**

Nuclear reactor principles: neutron mechanics, flux distribution. Reactor heat transfer: heat generation and removal, single and two phase flow. Analysis of reactor power plants. Pre: credit or registration in 422.

457 Marine Engineering (3) II**Munchmeyer**

Energy conversion systems for marine vehicles. System control. Propulsion devices. Pre: 311.

467 Optimum Design of Mechanical Elements**(3) I (2 L, 1 Lb)****Munchmeyer**

Analysis and design of machine components for strength, rigidity, fatigue, etc. Fastenings, transmission devices, selected topics. Pre: senior standing in ME or consent of instructor.

468 Introduction to Engineering Design (4) II (2 L, 2 Lb)**Munchmeyer**

Analysis and synthesis of integrated systems. Feasibility studies, design and decision processes. Techniques of optimization. Pre: 467.

471 Fundamentals of Space Dynamics (3) II**Stuiiver**

Motion of particle in central force field. Orbital mechanics. Rigid body motion. Euler equations and gyrostatics. Satellite motion and control. Pre: 375 or consent of instructor.

473 Mechanical Vibration and Shock (3) II

Burgess, Stuiver

Motion of elastic mechanical systems modeled by discrete elements. Systems of one, two, and several degrees of freedom. Response to transient (shock), sinusoidal, and random excitation. Methods of measurement and analysis. Pre: 371 and 375 or consent of instructor.

474 Fundamentals of Acoustics (3) I

Burgess

Wave motion in strings, bars, membranes, plates, and fluids. Plane and spherical acoustic waves. Transmission between media and through pipes. Resonators and filters. Methods of acoustic noise measurement and analysis. Pre: 375, or EE 312, or consent of instructor.

496 Mechanical Engineering Topics (arr.) I, II

Specialized topics in thermosciences, mechanics, materials, systems or design. Pre: consent of instructor.

499 Project (arr.) I, II

Investigation of advanced problems in mechanical engineering design or development. Pre: senior standing.

611 Classical Thermodynamics (3) I

Fox

Critical study of foundations of thermodynamics. Definitions, laws and corollaries. Generalization to chemical, electrical, magnetic and relativistic systems. Determination of equilibrium states. Pre: 312.

612 Statistical Thermodynamics (3) II

Chou

Review of probability and statistics. Study of classical and quantum mechanics. Independent particle statistics, Schrodinger wave equation, solutions for special cases of interest. Pre: 312.

621 Conduction Heat Transfer (3) I

Kihara

Steady and unsteady heat conduction with and without heat source in solids. Analytical, numerical, graphical, analog methods for solving heat conduction problems. Pre: 422.

622 Convection Heat Transfer (3) II

Fand

Heat transfer in laminar and turbulent boundary layer. Analogy between heat, momentum, mass transfer. Free convection, evaporation, condensation, mass transfer by diffusion. Pre: 422, 626.

623 Radiation Heat Transfer (3) II

Fox

Transmission of heat by radiation. Electromagnetic waves, Maxwell's equations, solutions for conductors and dielectrics. Radiosity methods, configuration factors, flux algebra. Radiation in gray enclosures with gases. Pre: 422.

624 Gasdynamics (3) I

Kihara

Multi-dimensional compressible flow in supersonic and subsonic regimes. Solutions by means of small perturbation theory, hodograph plane and method of characteristics. Pre: 424.

626 Viscous and Turbulent Flows (3) I

Fand

Navier-Stokes and energy equations, their formulation, properties and some exact solutions; laminar boundary layers; laminar stability, transition and turbulence; turbulent boundary layers; non-Newtonian fluids. Pre: 321.

628 Theory and Measurement of Turbulence (3) II

Fand

Theory of stability of laminar flows; mean motion, fluctuations and "apparent" turbulent stresses; universal velocity-distribution laws; turbulent flow through pipes and over flat plates; incompressible turbulent boundary layers with pressure gradients; turbulent boundary layers in compressible flow, free turbulence—jets and wakes; use of the hot wire anemometer to measure turbulence. Pre: 626.

630 Materials Science Laboratory (2) I

Htun, Larsen-Badse

Experimental determination of thermal, mechanical, chemical, electronic properties of materials as related to structure; influence of thermal treatments and of imperfections. Pre: consent of instructor.

631 Mechanical Properties of Materials (3) I

Htun

Atomic theory. Elastic, anelastic properties of solids. Dislocation theory of plastic deformation. Mechanisms of strengthening materials. Fracture, fatigue, creep. Pre: 331.

635 Corrosion Theory (3) I**Larsen-Badse**

Quantitative application of electrochemical theory and materials science to corrosion and oxidation reactions. Effect of environment. Cathodic protection, coatings, inhibitors, treatment of water and steam systems. Pre: 331.

636 Materials for the Ocean Environment (2) II**Larsen-Badse**

Application of materials science and corrosion theory to study of materials problems associated with ocean and to selection of materials of construction for this environment.

671 Mechanics of Continua I (3)**Johnson, Stuiver**

Stress and strain in continuous body. Review of vector analysis and development of Cartesian tensor calculus. Eulerian and Lagrangian descriptions of finite deformation. Equations of continuity, motion, state, energy. Applications to solids, liquids, gases. Pre: 371.

672 Mechanics of Continua II (3) II**Johnson, Stuiver**

Constitutive relations for elastic, visco-elastic, ideally plastic, strain hardening, strain-rate sensitive materials. Applications. Pre: 671.

696 Advanced Topics in Mechanical Engineering (arr.) I, II

Highly specialized topics in thermosciences, mechanics, materials, systems or design. Pre: consent of instructor.

697 Seminar (1) II

Current problems in all branches of mechanical engineering. All M.S.M.E. candidates are normally expected to attend, and registrants are expected to present talks. Pre: graduate standing, consent of instructor. May be repeated.

699 Directed Reading or Research (arr.) I, II

Directed study for graduate students on subject of mutual interest to student and a staff member. Student must find faculty sponsor before registering. Pre: consent of department chairman. May be repeated.

800. Thesis (arr.) I, II

Thesis for degree of M.S. in mechanical engineering. Pre: admission to candidacy and consent of thesis adviser.

Ocean Engineering (OE)

Professors BRETSCHNEIDER, GERRITSEN, PARVULESCU, ST. DENIS; Researcher O'BRIEN; Associate Researcher LEE; Assistant Professor VENEZIAN; Assistant Researcher SEIDL

401 Introduction to Ocean Engineering (3) I

Review of man's past, present and future ocean-oriented activities with particular reference to ocean engineering. Ocean engineering environments, materials and systems. Introduction to ocean system design process.

411 Naval Hydrostatics (3) I**Venezian**

Ship nomenclature and geometry. Hydrostatic principles of surface ships in free-floating, partially waterborne and damaged conditions and of submerged bodies. Introduction to ship strength. Regulatory considerations and introduction to ship economics. Pre: CE 270, ME 371 or equivalent courses and/or experience.

412 Naval Hydrodynamics I (3) II**St. Denis, Venezian**

Nature and determination of hydrodynamic resistance of ship and submarine hulls. Analysis of propelling devices emphasizing screw propellers. Propeller-hull interaction, powering considerations and speed power relationships. Pre: ME 321, OE 411 or equivalent courses and/or experience.

601 Ocean Engineering Laboratory (3) SS**Munchmeyer**

Design, construction and evaluation of an ocean engineering system. Field experience supplemented with appropriate theory. Pre: consent of department.

603 Ocean Engineering Environment (3) I

Bretschneider

Evaluation of ocean environment as it affects ocean engineering operations, design, construction, maintenance problems. Pre: Ocean 620 or equivalent (603 and Ocean 620 can be taken concurrently.)

609 Principles of Ocean Engineering (3) I

St. Denis, Seidl

Principles of ocean engineering as application of knowledge of fluid mechanics and oceanography to engineering problems encountered in coastal and marine environments. Pre: consent of instructor.

610 Viscous Fluid Dynamics (3) II

Venezian

Dynamics of real fluids with special emphasis on aspects of interest to ocean engineers. Navier-Stokes equations in inertial and rotating frames. Laminar and turbulent boundary layers. Heat flow, laminar stability and transition to turbulence. Diffusive processes. Pre: CE 322 or ME 321.

611 Naval Hydrodynamics II (3) I

St. Denis

Linear equations of ship motion and stability indices. Stability and control in horizontal and vertical planes. Theory and design of control surfaces. Experimental and theoretical determination of hydrodynamic derivatives. Influence of ship characteristics on motion stability. Pre: 411, 412 or equivalent course.

612 Naval Hydrodynamics III (3) II

St. Denis

Spectral analysis in seakeeping. Ocean waves. Ship response to wave action. Effects of ship motions and application to design. Hull vibration considerations. Pre: 411, 412, 611 or equivalent course.

614 Ocean Hydrodynamics Laboratory (2) II

Seidl, O'Brien

Experimental studies of ocean wave, current and sediment hydrodynamics and their relation to established theory. Look Laboratory of Oceanographic Engineering and nearby ocean front will be utilized. Pre: 609 or Ocean 620.

631-632 Design of Ocean Structures I & II (3-3) Yr.

St. Denis, Seidl

Design of ocean structures to withstand the hydrostatic and hydrodynamic loading of the sea. Considerations include: type of material, factors of safety, proportioning of scantling by elastic and plastic theories, stress concentrations, and fatigue. Application is made to design of submarine pressure hulls, cargo ships and oceangoing platforms.

661-662 Coastal and Harbor Engineering (3-3) Yr.

Bretschneider, Gerritsen

Solution of practical problems related to planning, design, construction, and maintenance of beaches, harbors and other coastal structures. Pre: consent of instructor.

671 Submarine Vehicle Naval Architecture (3) I

Environmental considerations, hydrostatic, hydrodynamic and structural mechanics principles pertinent to submarine vehicle system design. Pre-design and preliminary design procedures as applied to these systems.

696 Topics in Ocean Engineering (2)

Pre: graduate standing, consent of instructor.

697-698 Seminar in Ocean Engineering (1-1) Yr.

Pre: graduate standing, consent of instructor.

699 Directed Reading or Research (arr.) I, II

Pre: graduate standing, consent of instructor.

707-708 Statistical Dynamics of Ocean

Systems I & II (3-3) Yr.

St. Denis, Venezian

Waves of the sea, their loading on coastal and ocean structures and the responses of these structures are all characterized as statistical process. Provides a grounding in the fundamentals of time-series and spectral analysis and experience in the application of such statistical methods to actual problems.

800 Thesis Research (arr.)

Pre: candidacy for M.S. in ocean engineering.

Information Sciences (ISC)

Professors ABRAMSON, FERGUSON, JONES, KINARIWALA, KUO, MOOKINI, PACER, PETERSON, PITTS, SEIDLER, WATANABE; Associate Professor GAARDER; Assistant Professors LESTER, RODGERS, WALLEN

301-302 Computer and Information Sciences (3) I, II Abramson

Introduction to computers and computer programming. Elementary information theory and coding. Applications to linguistics, music, economics and the social sciences. Experimental work in the synthesis of codes using the IBM 360/65 will be required. Not intended for the information sciences or engineering major. Pre: High school algebra. (Identical to EE 307-308)

443 Statistical Data Analysis (3) I Jones

Estimation, hypothesis testing, regression, and other topics in data analysis, with emphasis on computer applications and underlying assumptions. Pre: Math 206 or equivalent plus some knowledge of probability and matrices.

446 Information Theory and Coding (3) I, II Lin

Fundamental properties of information. Sources and channels and coding of information. Applications to communication, linguistics, music, economics, psychology. Method of study based on elementary probability theory, but emphasis on significance of results. Open to all students. Pre: Math 134, junior standing or consent of instructor. (Identical to EE 446)

461 Digital Techniques (3) I, II Weldon

Number systems. Boolean algebra and combinatorial digital circuits. Logical design. Sequential circuits. Machine language instructions. Organization of simple computer. Pre-registration in EE 325 or consent of instructor. (Identical to EE 461)

466 Computer Organization and Programming Techniques (3) I Peterson

Organization and machine language of typical computers. Machine language programming techniques. Introduction to operating systems. Introduction to data structures, sorting, retrieving data from files of information. Pre: knowledge of FORTRAN programming or consent of instructor. (Identical to EE 466)

467 Algorithmic Languages (3) II Peterson

Introduction to algorithms, languages for describing them, associated programming techniques. Commonly used languages for numerical and non-numerical computation. Pre: knowledge of FORTRAN programming or consent of instructor. (Identical to EE 467)

491 Special Topics in Information Sciences (3) I, II Staff

Course content will reflect special interest of visiting and permanent faculty, and will be oriented toward juniors and seniors. In general, these will be in fields of computer systems, programming languages, artificial intelligence and computer nets. Pre: consent of instructor.

613 Linear System Analysis (3) I Kuo

Discussion of fundamental concepts. Study of linear graphs, network equations and computational algorithms in linear algebra. Use of state-space methods. Fourier transforms, generalized functions. Study of random signals in linear systems. Pre: EE 312 or equivalent. (Identical to EE 613)

625 Mathematical Properties of Natural Languages (3) I Lester

The rule governed nature of natural languages. Construction and evaluation of logical systems that mirror properties of natural languages. Pre: consent of instructor.

641 Discrete State Stochastic Processes (3) II Jones

Markov chains, Poisson processes, continuous time Markov processes, renewal processes, semi-Markov processes and point processes. Queues and other applications. Pre: Math 206 or equivalent plus some knowledge of probability and matrices.

648 Theory of Inference (3) I Watanabe

Concerned with formal and quantitative study of the process of inference in human mind and its computer simulation. Elements of information theory, structure analysis,

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deductive and inductive inference, classification, pattern recognition, theory making, theory of observation, theory of learning to be discussed.

650 Time Series Analysis (3) II

Jones

Filtering, prediction, spectrum estimation and transfer function estimation for stationary processes. Regression with stationary errors. Kalman recursive estimation. Random fields and space-time processes.

661 The Theory of Automata (3) I

Pager

Mealy and Moore sequential machines. Equivalence between machines and the minimalization of machines. Analysis and synthesis of machines. Nerve nets and regular expressions. Decision problems of finite automata. Turing machines. Canonical systems. Pre: consent of instructor. (Identical to EE 661)

693 Special Topics in Information Sciences (3) I, II

Staff

Course content will reflect special interests of visiting and permanent faculty, generally in fields of computer systems, programming languages, artificial intelligence and computer nets. Pre: consent of instructor.

697 Seminar in Information Sciences (1) I, II

Jones

Pre: graduate standing, consent of instructor.

699 Directed Reading (arr.) I, II

Staff

Graduate standing, consent of instructor.

Division of Continuing Education

(College of General Studies)

THE DIVISION OF CONTINUING EDUCATION and Community Service (formerly College of General Studies), established in 1956, is primarily concerned with meeting the continuing education needs of individuals and groups in the state. Programs designed for this purpose include conferences, institutes, informal courses, lyceums, lectures, and educational experiences designed for particular purposes or groups. These continuing education programs are available to all interested adults.

The Division also provides educational opportunities for students who cannot because of time or distance attend courses regularly scheduled on campus. Degree credit courses for these persons are scheduled in the evening on campus and at various other places and times on Oahu and the other islands. Such courses are open to all students who have been regularly admitted to the University.

In addition the Division administers the academic affairs of students who have been admitted to the University, but are not candidates for a degree at this institution. These students may attend full or part time in the day or evening. Inasmuch as they have no required program of study, such students have great latitude in the selection of their courses. They must, however, comply with other requirements and regulations of the University and must have completed any prerequisites required for the courses they choose.

Credit Courses. A group of basic courses, including the general education courses required by all degree curricula, are offered both on and off campus. Advanced courses are offered when needed by a substantial number of evening students. Admission is governed by general University requirements, and regular residence credit is given, including graduate credit where applicable.

On-campus accelerated evening courses are scheduled four times a year. Off-campus accelerated programs are also offered four times a year at Fort Shafter, Hickam Air Force Base, Kaneohe MCAS, Pearl Harbor, Schofield Centers, Wheeler Air Force Base, and other off-campus locations.

DIVISION OF CONTINUING EDUCATION

Courses are also taught on Hawaii, Maui, Kauai, Molokai, and Lanai, either by faculty members commuting from the Manoa campus or by other qualified personnel. Schedules for off-campus courses are arranged to fit the needs of students when such adjustments are academically acceptable.

In addition to its program within the state, the Division operates overseas centers at Kwajalein, Midway, and Wake Island. Selected courses for credit are given in an effort to meet the needs of personnel, both military and civilian, stationed in these areas.

Non-Credit Courses. Short courses covering selected college-level material in art, business, English, engineering, foreign languages, mathematics, general culture and other subjects are offered on and off campus. These and other special courses are offered when needed to provide training in specific professional or vocational areas, to prepare candidates for professional licensing examinations or to assist with special local problems. Non-credit courses are generally scheduled in the evening.

Sessions begin in January, April, July, and October. Any person with the equivalent of a high school education who can profit from these courses may enroll. Students who regularly attend receive certificates upon completion of their course of study.

Special and Professional Programs was organized in 1967 to integrate a wide range of non-credit university level continuing education programs. These include the Conference Center, Civil Defense Training, and sequential programs for professional in-service education. Also included are experimental programs in Women's Continuing Education, Public Issues Discussions, and Education for the Aged.

The Conference Center was established in 1961. Its program serves community groups and University departments by providing planning and administrative services for conference, institute, and workshop programs. The staff works closely with University departments and with both public and private organizations on all levels of continuing education activity in the state. In coordinating University resources with community needs, reliance is placed particularly on the advice and working cooperation of interested departments and divisions.

Institutes, workshops, and conferences are also initiated and presented where need is evident and resources are available. Such programs are developed with the advice and assistance of individuals and groups in the University and the community.

Services include assistance in planning; preparation and administration of budgets; procurement of resource persons; arrangement of travel, living accommodations and facilities, including related services; preparation of final financial and proceedings reports. Flexible scheduling of activities makes it possible to accommodate requests as they arise.

Civil Defense Training Program. Under contract with the Department of Defense, the Division offers courses to train Shelter Management and Radiological Monitor instructors. Additional courses offered are Radiological Defense Officer, Civil Defense Management, Shelter Management, and Emergency Operating Center Simulation Workshops. The program is also responsible for conducting conferences in civil defense for business and industry. Courses and conferences are offered on all islands.

Center for Governmental Development. The Center was authorized by the State Legislature to provide in-service training, scholarships, internships and other means to aid in the development of government officers and employees. The Center presents and coordinates courses, workshops, seminars and programs in public administration and serves as a clearing house for information and training in government-management practices, techniques and new technologies.

The Lyceum and Speakers' Bureau program provides informal on-going education through lectures, discussions, concerts and other presentations throughout the state by: (1) a touring subscription series of lecture, dance, drama, literary and musical events presented annually; (2) single speakers and/or short cultural programs offered to organizations as an adjunct to their meetings upon request (a \$10 fee for each engagement is charged for this service); (3) lecture series planned and administered with the military services and community colleges and Hilo Campus several times a year as needed; (4) a film-discussion series sponsored by the Division in areas where such a program is desired.

Headstart Regional Training Program. Under federal funding, a Headstart Regional Training Program provides sub-professional training for workers in headstart preschool programs in the state.

Manuscript Criticism Service. Writers of fiction, non-fiction, poetry, and drama may submit manuscripts for professional opinion and advice of qualified faculty members. Reading fees are available on request.

Announcements and other information concerning these varied programs will be made available by the Division upon request.



College of Health Sciences and Social Welfare

THE COLLEGE OF HEALTH SCIENCES AND SOCIAL WELFARE provides educational programs and fosters research in the health fields of medicine, public health, nursing, and social work.

The School of Medicine carries students through the first two years in medicine, after which two further years in a mainland school lead to the M.D. degree; or, alternately, may lead to an advanced degree in a basic medical science, or in public health.

The School of Public Health offers programs leading to the M.P.H. or M.S. degrees.

The School of Nursing prepares students in professional nursing, technical nursing, and dental hygiene. The programs in dental hygiene and in technical nursing are lower division programs; that in professional nursing includes an upper division program leading to the B.S. degree, and a graduate program for specialization in mental health—psychiatric nursing, community health nursing, and administration of organized nursing services leading to the M.S. degree.

The School of Social Work offers a two-year graduate program leading to the M.S.W. degree. The School also offers courses on the undergraduate and preprofessional levels for juniors and seniors.

SCHOOL OF MEDICINE

The School of Medicine was created in 1965 as increased interest developed in health education and research in Hawaii and the Pacific area. Provisional accreditation was granted in 1965 and the first class of 27 students was admitted in September, 1967.

Admission and Degree Requirements

A. Medical Students

"Medicine has 1,000 doors," some for skillful clinicians, some for teachers and researchers; some for those who wish to work with people, some for those who wish to work with figures, chemicals, or animals;

some for those who wish to work at home and some for those who want to work in the international scene. The School seeks students with various talents and interests, and a serious attempt is made to recognize and foster these special qualities.

Applicants to the School of Medicine for the curriculum in medicine must have completed at least three years (about 90 semester units) of college work. Preference will be given those who possess a bachelor's degree. Students at the University of Hawaii will commonly have a bachelor's degree in biological sciences, but the degree may be in any field. An effort toward breadth of learning, both in the humanities and in the sciences, should be made.

The following specific work is required for entry into the School of Medicine.

Special Requirements for Admission to the School of Medicine

Biology: at least 10 units; work through comparative anatomy, embryology, and the fundamentals of genetics is desirable.

Chemistry: at least 16 units, including quantitative analysis and organic chemistry. Organic chemistry laboratory and physical chemistry are desirable.

Physics: at least 8 units.

Mathematics: work through one semester of calculus; one year is desirable.

Medical College Admission Test (MCAT): required of all medical applicants.

The first year class is limited to 40 students. Preliminary applications are due October 1 and formal applications and supporting papers must be received before December 1 for consideration for admission the following September.

Correspondence regarding admission should be directed to: Admissions Office, University of Hawaii School of Medicine, 3675 Kilauea Avenue, Honolulu, Hawaii 96816.

B. Non-medical students

Applicants to the School of Medicine for B.S., M.S., or Ph.D. degrees should fulfill the requirements as noted for the specific disciplines, for instance, biochemistry, or medical technology.

Application for admission to any of the departments of the School of Medicine as a candidate for a master's degree or doctor's degree in a specific discipline should be directed to the Dean of the Graduate Division; for a bachelor's degree it should be directed to the admissions office noted above.

Curriculum for Medical Students

Medical students will follow a two-year curriculum designed to make transfer possible at the end of the second year to the junior class of any mainland medical school. Elective time is provided in both years to allow development of special interests.

Provision is made for a limited number of students who wish to take the work spread over a three-year period, or longer. For further information, see *Bulletin of the School of Medicine*.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
Functional Microscopic Anatomy (Anat 601)	4	Functional Human Anatomy (Anat 602)	5
Medical Biochemistry (Bioch 605)	4	Neuroanatomy (Anat 604)	2
Biochemistry Laboratory (Bioch 611)	2	History-Taking and Physical Examination (Med 602)	3
Medical Genetics (Genet 611)	2	Human Physiology (Physl 602)	6
Clinical Correlation I (Med 601)	1		—
Introduction to Human Behavior (Psyty 607)	2		16
Principles of Community Medicine (PH 696)	2		
	—		
	17		

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
Clinical Judgment (Med 611)	3	Clinical Judgment (Med 612)	3
Clinical Conference (Med 671)	1	Clinical Conference (Med 672)	1
Human Growth & Development (Med 615)	1	Human Pathology (Path 602)	4
Human Pathology (Path 601)	4	Laboratory Diagnosis II (Path 650)	2
Laboratory Diagnosis I (Path 649)	2	Pharmacology: Actions and uses of Drugs (Pharm 600)	5
Tropical Medicine & Medical Microbiology (TrMed 606)	5	Psychopathology (Psyty 616)	1
	—	Community Medicine (PH 786)	1
	16		—
			17

Allied Medical Sciences

Division of Comparative Medicine (CpMed)

Associate Professor PALUMBO

The division of comparative medicine participates in graduate instruction, provides materials and guidance for research with emphasis on the study of disease processes in animals which relate to human health and biomedical research.

451 The Use of Animals in Research (2) I

Palumbo

To acquaint students with concepts and methods in use and care of experimental animals.

Division of Medical Technology (MT)

Assistant Professors BELL, BHAGAVAN, UEMURA; Instructors KAGAWA, MOIKEHA, SONODA, TAYLOR, WULFF

Two programs leading to a B.S. degree in medical technology are presently offered. In Option II (which, for convenience, is called the 4 + 1 program) inaugurated in the fall semester of 1967, the degree is granted before internship. The interning year leading to registration with the National Society of Clinical Pathologists follows graduation and may be taken at one of the five affiliating hospitals here in Honolulu or at any other qualified School of Medical Technology in the United States. University credit is not granted for this year.

Option I is open to those students enrolled as freshmen before Fall, 1967 or qualified transfer students from other U.H. programs or other institutions. Upon completing the required courses on campus, internship is taken in one of the five affiliating hospitals for which 28 credits are given. Such students may elect Option II if they wish.

The first two years of either option are spent in the College of Arts and Sciences, but since scheduling of science courses in sequence is most important, a prospective student should designate his major as Pre-Med Tech as soon as possible. The last two years of the program are administered by the School of Medicine. Application to the Medical Technology program in the School of Medicine should be made early in the semester of the sophomore year.

Degree Requirements

To be entitled to a degree of bachelor of science in medical technology, the student must:

1. Complete the course of subjects specified in the curriculum of Medical Technology, including 31 hours of the major in Option II and 39 in Option I;
2. offer at least 60 hours of credit in other than introductory courses, meeting the University core requirement;
3. acquire an aggregate of 130 semester hours of credit;
4. earn at least a 2.0 grade point ratio (*C* average) for all registered courses and a grade of *C* or higher in each major course and related course required for the degree;
5. submit an application for graduation to the office of admissions and records during the semester preceding the awarding of the degree.

OPTION I

FRESHMAN YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
Chemistry 113-115	4	Chemistry 114-116	4
History 151	3	Hist 152	3
Eng 100	3	Speech 145	3
Math 134 or 135	4	Electives	6
Total	14	Total	16

An accelerated one semester course in chemistry is offered for especially well prepared students.

SOPHOMORE YEAR

Bio 220	5	Micro 351	3
Eng Lit	3	Eng Lit	3
MT 151	2	MT 152	2
Chem 133-134	4	Chem 241-242	4
Electives	4	Electives	6
Total	18	Total	18

JUNIOR YEAR

Micro 461-463	4	Micro 462-464	4
Physiol 301	4	Biochem 441	4
Electives	10	Zoo 340 or MT 497	3
Total	18	MT 464	3
		Electives	4
		Total	18

SENIOR YEAR	
SUMMER SESSION:	
MT 466 Internship	4
FIRST SEMESTER	
MT 467 Internship	12
SECOND SEMESTER	
MT 468 Internship	12

OPTION II

FRESHMAN YEAR

FALL SEMESTER		SPRING SEMESTER	
	CREDITS		CREDITS
Chemistry 113-115	4	Chemistry 114-116	4
History 151	3	History 152	3
Eng 100	3	Speech 145	3
Math 134	4	MT 152	2
MT 151	2	Elective	3
Total	16	Total	15

There is an accelerated one semester course in Chemistry for especially well prepared students.

SOPHOMORE YEAR

Bio 220	5	Bio 250	4
Eng Lit	3	Eng Lit	3
Chem 243	4	Chem 244 (lecture only)	3
Electives	6	Chem 133 and Chem 144	4
Total	18	Elective	3
		Total	17

Electives: 3 credits in Humanities; 6 credits in Social Sciences.

JUNIOR YEAR

Physiology 301	4	Biochem 441 or Ag Bio 402	4
Micro 351	4	Physics 161	4
MT 497 Med Parasit	3	Electives	9
Physics 160	4	Total	17
Total	15		

SENIOR YEAR

Micro 461-463	4	Micro 462-464	4
MT 451 Hematology	3	MT 464 Immunohematol	3
MT 471-473 Clin Lab	4	MT 472-474 Clin Lab	3
Electives	6	MT 458 Clin Lab Instr	4
Total	17	Elective	3
		Total	17

151-152 Introduction to Medical Technology (2-2) Yr.**Wulff**

Designed to acquaint student with relationship of medical technology to medical field.

451 Basic Hematology (3) I**Kagawa, Uemura**

Fundamental study of blood in normal and pathological states: formation, development classification of blood cells. Pre: Micro 351, Physiol 301.

458 Clinical Laboratory Instruments (3) II**Moikeha**

Principles of spectrophotometry, optics, electronic measurement. Pre: college physics, MT 471-473, concurrent registration in 472-474.

464 Immunohematology (3) II**Taylor**

Antigen-antibody relationships in human blood, study of blood groups, clinical problems in transfusion. Pre: Micro 361 or consent of instructor.

466, 467, 468 Internship (4-12-12) SS, I, II

Internship in affiliated hospital. Pre: three years of prescribed courses and at least one semester on U.H. campus.

471-472 The Clinical Laboratory, Lecture (2-2) Yr.**Bhagavan****473-474 The Clinical Laboratory, Lab. (2-2) I, II****Sonoda**

Pathological processes involved in organic and infectious diseases and laboratory techniques used in their clinical diagnosis and measurement. Pre: Physiol 301, Basic Biochem.

497 Medical Parasitology (3) I**Bell**

Diagnosis of parasitic diseases by laboratory methods: outstanding feature of life cycles, classification and medical significance of parasites.

499 Directed Reading and Research (arr.) I, II

Division of Speech Pathology and Audiology (SPA)

Professor ANSBERRY; Associate Professor RITTER; Assistant Professors MAY, PANG-CHING; Associate Clinical Professor WATSON

Students who plan to obtain a B.S. degree in speech pathology and audiology should complete their University curriculum requirements in the College of Arts and Sciences during their first two years of residence. At the end of the second year, a transfer should be made to the School of Medicine, College of Health Sciences and Social Welfare.

Specialized courses in speech pathology and audiology required for the undergraduate major are: 300, 301, 302, 303, 320, 402, 410, and 411. Other specific requirements include: Linguistics 410, or Speech 210, Psychology 100, 110, 111, and 320; at least 4 credits in physics and a minimum of 3 credits in mathematics. A minimum of 124 semester hours of credit is required.

Students in the College of Education who wish to specialize in this area will require special programs and should consult with the division of speech pathology and audiology as soon as possible after initial enrollment.

UNDERGRADUATE COURSES

- 300 Introduction to Speech Correction (3) I** Ritter
Survey of field of speech correction; study of types of speech defects and hearing problems as they relate to speech dysfunctions.
- 301 Introduction to Audiology (3) I** Ansberry
Basic concepts: psychoacoustics, anatomy and physiology, measurement of hearing, rehabilitation of hard-of-hearing.
- 302 Methodology of Speech Correction (3) II** Ritter
Methods used in clinical procedures for organic and functional disorders of speech; observation of clinical procedures. Pre: 300; Ling 410.
- 303 Testing of Hearing (3) II** Pang-Ching
Screening testing programs; conventional and special tests of hearing; interpretation of results; observations of clinical audiometry. Pre: 301.
- 320 Speech and Hearing Science (3) II** Ritter
Study of science of speech and hearing including anatomy and physiology of organs involved.
- 402 Pathology of Speech (3) I** May
Etiology and symptomatology of speech and language disorders. Pre: 300, 302, 320.
- 410 Practicum in Speech Pathology (3) II** Ritter, May
Clinical practice in use of diagnostic procedures and rehabilitation techniques with variety of speech disorders at various age levels. Pre: 300, 302, 320, 402.
- 411 Practicum in Audiology (3) I** Ansberry, Pang-Ching
Clinical practice in testing of hearing, hearing conservation, auditory training, speech reading, speech correction and conservation. Pre: 303.

GRADUATE COURSES

- 600 Research Methods (3) I** Pang-Ching
Research methods applicable to field of speech pathology and audiology: analysis and reporting of data; bibliography; contemporary research. Required of all graduate students.
- 610 Organic Disorders of Speech (3) I** May
Study of disorders of speech resulting from organic anomalies: cleft palate, cerebral palsy, laryngectomy, brain injury.
- 611 Auditory Training and Speech Reading (3) I** Pang-Ching
Principles and methods of development of maximum communication ability through training in use of residual hearing and by observation of visible bodily clues.
- 612 Functional Disorders of Speech (3) II** May
Diagnostic and therapeutic approaches to disorders of speech which are primarily functional in nature—articulation, voice, rhythm, language.
- 613 Language Development for Children with Hearing Deficiencies (3) II** Pang-Ching
Language acquisition by hard-of-hearing and deaf children; methods of stimulating growth.
- 701 Advanced Audiology (3) I** Ansberry
Instrumentation; selection of hearing aids; special tests of hearing; vocational problems of individuals with impaired hearing.
- 710 Advanced Practicum in Speech Pathology (3-6) I, II** Ritter, May
(1) General clinical; (2) public school. Supervised clinical practice in diagnostic and therapeutic procedures.

- 711 Advanced Practicum in Audiology (3-6) I, II** **Ansberry, Pang-Ching**
 (1) General clinical; (2) public school. Supervised clinical practice in administering special tests; interpretation of audiograms; counseling of individuals with impaired hearing; use of varied rehabilitation techniques.
- 720 Seminar in Speech Pathology (3) I, II** **Ritter**
 (1) Diagnostic procedures; (2) functional disorders; (3) organic disorders. Section 1 1st sem.; sections 2 and 3 2nd sem. in alternate years. Section 2 not offered in 1969-70. May be repeated.
- 721 Seminar in Audiology (3) I, II** **Ansberry**
 (1) Diagnostic procedures; (2) rehabilitation. Section 1 2nd sem.; section 2 1st sem. May be repeated.
- 799 Research (1-4), I, II** **Ansberry, Ritter, Pang-Ching**
 (1) Speech pathology; (2) audiology. Required of all graduate students following non-thesis program (Plan B); open to other qualified graduate students.
- 800 Thesis Research (8) I, II** **Ansberry, Ritter, Pang-Ching**
 (1) Speech pathology; (2) audiology. Limited to graduate students enrolled in thesis program (Plan A).

Anatomy (Anat)

Professors DE FEO, NOYES; Associate Professor DIAMOND; Assistant Professor YANAGIMACHI; Associate Clinical Professor GORDON; Assistant Clinical Professor DEN

Instruction in the department of anatomy is planned primarily to meet the needs of medical and graduate students but, insofar as facilities permit, all of the courses are open to other properly qualified third- and fourth-year undergraduate students. Those who are not registered in medicine but wish to take work in the department should make arrangements in advance with the instructors concerned.

Facilities are available for a limited number of doctors of medicine, or others with equivalent training, who may wish to do special dissections or pursue work on problems within the scope of the department.

The primary research and graduate training effort of the department is in the biology of mammalian reproduction and includes such related aspects as development, endocrinology and sexual behavior. Graduate programs combining work in anatomy with other fields, e.g., physiology, psychology and zoology can be arranged.

- 601 Functional Microscopic Anatomy (4) I** **De Feo, Staff**
 Structural and functional correlates in organization of human cells and tissues as revealed through light and electron microscopy. Pre: admission to Medical School, or equivalent and consent of instructor for non-medical students.
- 602 Functional Human Anatomy (5) II** **Noyes, Staff**
 Structure and function of various organ systems of human body. Laboratory dissection and demonstration. Pre: admission to Medical School, or equivalent and consent of instructor for non-medical students.
- 604 Neuroanatomy (2) II** **Diamond, Staff**
 Structural and functional organization of human nervous system. Pre: admission to Medical School, or equivalent and consent of instructor for non-medical students.

630 Reproductive Biology (3) II

De Feo, Staff

Comprehensive study of morphology, biochemistry, physiology of reproductive system in a number of experimental animals. Major emphasis on mammals and their regulatory mechanisms (local, endocrine, neural). Pre: 601 or equivalent and consent of instructor.

631 Reproduction and Sexuality (2) I

Diamond, Staff

This lecture-seminar course will provide the developing professional with fundamental information facilitating his understanding and treatment of various subjects and problems related to human sex and reproduction. Pre: enrollment in Medical School or Graduate Division (with permission of instructor).

634 Experimental Methods in the Study of Reproductive Behavior (arr.) II

Diamond

Individual research on endocrine and neural aspects of sexual behavior in experimental animals. Pre: one year of psychology; one year of zoology; consent of instructor.

636 Seminar: Current Readings in Reproductive Behavior (2) II

Diamond

Seminar which attempts to correlate observed behavior with underlying causal factors and influences with particular emphasis on structural and chemical mediators of behavior. Pre: one year of psychology; one year of zoology; consent of instructor.

691 Seminar (1) I, II

Current topics of biologic structure and function; reports, discussions. May be repeated. Pre: consent of instructor.

699 Directed Research (arr.) I, II

Each graduate student selects preceptor and a problem compatible with laboratory equipment and experimental animals required. Several students may work on various aspects of a general problem currently under study. Students learn specific techniques, methodology and pitfalls of experimental research under close guidance by faculty member. Pre: consent of instructor.

Biochemistry (Bioch) and Biophysics (Bioph)

Professors GREENWOOD, PIETTE, WINNICK, YASUNOBU; Associate Professors MANDEL, MANN, McKAY, MOWER; Assistant Professor MORTON

The biochemistry and biophysics department offers graduate programs leading to the M.S. and Ph.D. degrees, and provides the requisite courses for medical students.

601-602 (or the equivalent) is prerequisite for all graduate work in this department.

BIOCHEMISTRY

441 Basic Biochemistry (3) II

Winnick, Yasunobu

Lectures on function and composition of biological substances and their metabolic transformation in animals, plants, micro-organisms. Pre: Chem 113-114, 243, 244 or equivalent.

442 Basic Biochemistry Laboratory (1) II (1 Lb)

McKay

Experiments working with substances discussed in 441.

601-602 General Biochemistry (3-3) Yr.

Yasunobu, Mower

Comprehensive survey of chemistry, structure, metabolism, physiological functions of important components of living organisms. Pre: Chem 243-244, Chem 351-352, or consent of instructor.

605 Medical Biochemistry (4) I**Greenwood, Mower**

Survey of the field of biochemistry with particular emphasis upon contributions of this subject to the medical and biological sciences. Pre: acceptance in medical school, Chem 113-114, 243, 244 or equivalent.

611-612 General Biochemistry Laboratory (2-2) Yr. (2 Lb)**McKay**

Selected physico-chemical and metabolic experiments to illustrate important principles of 601-602.

671 Seminar (1) I, II

Weekly discussions and reports on various subjects; current advances in biochemistry and biophysics.

710 Special Topics in Enzymology (2) II

Selected detailed discussions on properties and mechanism of action of several important enzymes. Pre: 601-602. (Alt. yrs., not offered 1969-70.)

715 Advanced Carbohydrate Metabolism (2) I

Chemistry and metabolism of sugars, polysaccharides, glycolipids, and glycoproteins. Role of carbohydrates in immunology. Pre: 601-602. (Alt. yrs., not offered 1969-70.)

720 Bioenergetics (2) I**Mower**

Current topics on mechanism of energy production and transformation in living organisms. Photosynthesis, oxidative and substrate level phosphorylation. Pre: 601-602. (Alt. yrs., not offered 1969-70.)

730 Nucleic Acids and Viruses (2) I

Current topics on DNA and RNA, radiation effects, cytoplasmic inheritance, mutagenesis, chemistry of the gene. Molecular biology of bacteriophages. Pre: 601-602. (Alt. yrs., not offered 1969-70.)

740 Advanced Protein Chemistry (2) I**Yasunobu**

Reactions of protein with various reagents, methods of amino acid sequence determination. Discussion of protein structure and evolution of biologically active polypeptides. Pre: 601-602.

799 Directed Research (arr.) I, II

Students may register on approval of department.

800 Thesis Research (arr.) I, II

Approval of department faculty required.

BIOPHYSICS**601 Survey of Biophysics (3) I****Piette**

Theory and application of various physico-chemical techniques used in molecular biology, including optical absorption, light scattering, magnetic resonance, ultracentrifugation, viscometry, microscopy, circular dichroism and optical rotary dispersion. Pre: Chem 351-352 and Math 206.

602 Survey of Biophysics (3) II**Mann**

Structure and biological significance of water, physical chemistry of biopolymers and relationship of their structure to biological function. Pre: 601.

603 Biophysics Laboratory (3) II**Mandel**

Application of physio-chemical techniques to biological systems. Use of analytical ultracentrifuge absorption, optical absorption, electron spin resonance, viscometry, diffusion and light scattering. Pre: 601 and 602.

701 Molecular Structure and Function of Chromosomes (2) I**Mandel**

Physical properties of phage and bacterial chromosomes as determined by sedimentation velocity, buoyant density, ultraviolet absorption autoradiography, electron microscopic techniques, and their correlation with genetic structure and function. Pre: 601 and 602. (Alt. yrs., not offered 1969-70.)

**702 Electron and Nuclear Magnetic Resonance Studies
in Biological Systems (2) II**

Mandel, Piette

Theory of nuclear and electron magnetic resonance. Considerations of relaxation mechanisms and applications to biological systems. (Alt. yrs., offered 1969-70.)

703 Conformational Analysis of Biopolymers (2) I

Discussion of applications of statistical mechanics to study of macromolecules in solution with special emphasis on biopolymers. Calculation of average dimensions of randomly coiling macromolecules, including polyelectrolytes, helix-coil transition in polypeptides and polynucleotides, discussion of protein and nucleic acid denaturation. Pre: 601 and 602.

704 The Role of Free Radicals in Biological Systems (2) II

Piette

Discussion of univalent biological oxidation-reduction. Electron transport phenomena in enzyme systems. Experimental techniques in following fast univalent reactions. Role of free radicals in photosynthesis and other photo-biological systems.

799 Directed Research (arr.) I, II

Students may register on approval of department.

800 Thesis Research (arr.) I, II

Approval of department faculty required.

Community Medicine (PH)

(Affiliate from the School of Public Health)

Professors LEE, BURBANK, CHAR, CHUNG, CONNOR, GILBERT, GROSSMAN, SACHS, SCHWARTZ, WORTH; Associate Professors CLARK, DAVENPORT, DICKINSON, FURUNO, HANKIN, JENKINS, MASUDA, MATSUMOTO, MYTINGER, PARK, SMITH, VOULGARPOULOS, WOLFF; Assistant Professors BELL, HAYAKAWA, STRINGFELLOW, SUEHIRO, YOUNG

The School of Public Health provides instruction to students in the Medical School and serves the academic function of a department of community medicine for the Medical School.

The following courses are part of the required curriculum for medical students:

696 Principles of Community Medicine (2) I

Gilbert, Staff

Public health-preventive medicine course open only to 1st year medical students, taught in conjunction with introductory course in clinical correlation (Med 601) to examine the environmental and social routes of disease, stressing prevention where possible.

786 Preventive Medicine (1) II

Gilbert, Staff

Exploration of agencies and services available *outside the hospital* for prevention of disease and desirability. Open only to 2nd year medical students, taught in conjunction with clinical courses; field trips, home visits required.

Genetics (Genet)

Professors ASHTON, MORTON; Associate Professors HUNT, MI, RASHAD; Associate Clinical Professors HALPERIN, WAXMAN

The M.S. and Ph.D. in genetics are offered in human genetics, biochemical genetics, and immunogenetics. Intended candidates must have or acquire adequate preparation in biology, biometrics, chemistry through organic chemistry, analytic geometry and calculus, genetics, and physics. For human genetics additional undergraduate requirements are anthropology and human genetics. For immunogenetics, the undergraduate preparation should include general microbiology, comparative anatomy and embryology.

451 Principles of Genetics (3) I

Ashton

Fundamental genetic principles, with examples from microorganisms, plants, animals, man. Pre: one semester of biological science. College algebra and elementary chemistry recommended.

452 Genetics Laboratory (1) I

Experiments with a variety of organisms to illustrate principles of 451.

480 Molecular Genetics (3) II

Hunt

Genetic principles at cellular level as related by structure of proteins and nucleic acid to genetic fine structure, mutagenesis, transfer of genetic information and control of development. Pre: 451 and one semester of biochemistry recommended, and consent of instructor.

602 Techniques in Genetics (2) II

Ashton, Hunt

Modern techniques and relevant study for high school teachers of biology. Pre: consent of instructor and school teaching experience.

611 Genetics for Medical Students (2) I

Rashad

Principles of genetics for medical students. Pre: consent of instructor.

618 Cytogenetics (3) II (2 L, 1 Lb)

Rashad

Correlation of genetic and cytological phenomena. Pre: 451, Bot 418 recommended. (Alt. yrs.; offered 1969-70.)

625 Advanced Topics in Genetics (2) I, II

Advanced treatment of frontiers in genetics. Pre: graduate standing in genetics or consent of instructor.

650 Population Genetics (3) II

Morton

Mathematical, observational, and experimental results bearing on effects of mutation, selection, and systems of mating on distribution of genes. Genetic analysis of non-experimental populations, especially man. Pre: 451; elements of calculus, probability and statistics. (Alt. yrs.; not offered 1969-70.)

654 Genetics Seminar (1) I, II

Ashton

Research and topical literature reports in genetics. May be repeated. Pre: graduate standing in genetics or consent of instructor.

660 Statistical Methodology in Genetics (3) I

Mi

Application of statistics to genetics and human biology, with emphasis on high speed computing methods. Pre: 451 or equivalent, calculus, biometry or statistics. (Alt. yrs.; not offered 1969-70.)

699 Directed Research (arr.) I, II

Pre: graduate standing; consent of instructor.

800 Thesis Research (arr.) I, II

Pre: consent of instructor.

**GRADUATE COURSES IN GENETICS OFFERED BY
OTHER DEPARTMENTS**

- *BIOCHEMISTRY 730** Nucleic Acids and Viruses
- *HORTICULTURE 655** Radiation Biology
- *ANIMAL SCIENCES 645** Advanced Animal Breeding
- †MICROBIOLOGY 671** Microbial Genetics

*Not offered 1969-70.

†Offered 1969-70.

Medicine (Med)

Professors BLAISDELL, BRODSKY, GARDNER, GAULT, N. L. JR., NUGENT; Clinical Professors ARNOLD, H. L. JR., BARRETT, MOSER; Associate Professors BUDY, GAULT, S. J., SIMPSON (OKINAWA); Associate Clinical Professors ALLISON, GILBERT, HARTWELL, JIM, R., KAGAN, LEVIN, LIN, NORDYKE, ORBISON, YIM, YOKOYAMA; Assistant Professors CHING, G., MILLER, F. L.; Assistant Clinical Professors ANDERSON, BEDDOW, BLOMQUIST (SAMOA), CHESNE, CHUN, H. H., DURDEN, EARLL, ENGSTROM, FONG, H., FRYER, GLOBER, GOLD, GOLDSTEIN, GOSHI, GOTO, U., HELMLY, KIM, R., LEE, W. Y., MAYS, MIYAHARA, NAY, OISHI, N., OSBORN, PALMER, REILEY, SETO, SIEMSON, YAMADA; Clinical Instructors BALL, BOELLING, BOTTICELLI, CHANG, W. Y. K., EITH, FONG, B., GARRETSOHN, GILMAN, HASHIMOTO, HO, R., HORIO, KEENAN, KEM, KIM, J., KOBASHIGAWA, LAU, T. K. L., LIMBER, LUM, C. M., MACGRUDER, MEHTA, MORRIS, NEILSON, OKIHIRO, POPPER, SHIRASU, SINGLETON, SMITH, R. SUZUKI, G., UY, WAKAI, WALDRON (OKINAWA), WATT, W., WEINER, WRIGHT, YAMAKIDO

The department assumes major responsibility for assisting the student in integrating his learning in the humanities, social sciences, and the physical and biological sciences by confrontation with clinical situations. Thus, operational knowledge ranging from the structure and behavior of submolecular particles, through that of the whole human organism, to that of social interactions are correlated and brought to bear on the problems of health and disease and the individual patient.

Early attention is given to the student's acquisition of habits of continuing, critical and disciplined self-education, and basic clinical skills. These skills include collection and evaluation of data, systematic reasoning in case problem-solving, and consideration and perceptiveness in dealing with patients, their families, and other members of the health team.

The department also participates in internship and residency training programs in affiliated hospitals. The close association of the student with graduate physicians in these programs also affords valuable learning experiences.

Research in selected clinical fields, for which facilities are available, is fostered.

301-302 The Individual and Illness (3-3) Yr.**Fancher, Blaisdell**

Broad overview of major functional and structural changes which occur in health and illness; 2 hours lecture and 3 hours laboratory experience weekly. Pre: concurrent registration in Physiology 301 or consent of instructor.

Given jointly with department of professional nursing (see Medical Science 301-302).

401 The Individual and Illness (3) I**Fancher, Blaisdell**

Broad overview of major functional and structural changes which occur in health and illness; lectures and seminars weekly. Pre: 302 or consent of instructor.

Given jointly with department of professional nursing (see Medical Science 401).

601 Clinical Correlation (1) I**Noyes, Shirkey, Blaisdell, Staff**

Correlation of anatomy, biochemistry, genetics, physiology and public health with natural history of health and illness. Focus each week on patient cases demonstrating principles or application of material covered during the same week in non-clinical courses. Students guided by Clinical Tutors, with participation by clinical sub-specialists as appropriate. For first-year students. Pre: consent of instructor.

602 History-Taking and Physical Examination (3) II**Mamiya, Noyes, Nugent,****Shirkey, Staff**

Instruction through student participation with Clinical Tutors, and use of patients in the clinics and hospitals with emphasis on modern techniques and pathophysiologic basis of symptoms and signs. For first-year students. Pre: consent of instructor.

603 Historical Introduction to Medicine (1) I**Blaisdell, Worth**

Consideration of the inter-relationships of the historical, ethical, social and scientific aspects of medicine. Topics correlated with concurrent courses in the first year. For first-year students. Pre: consent of instructor. (Not offered 1969-70).

611-612 Clinical Judgment (3-3) Yr.**Barrett, Blaisdell, Gardner, Nugent, Staff**

Clinical problem-solving with collection of data analysis of symptoms, signs, laboratory data and previous therapy; pathogenetic formulation; plan of management; oral case presentations; subspecialty sessions. Instruction coordinated with concurrent courses. For second-year students. Pre: consent of instructor.

615 Human Growth and Development (1) I**Char, Shirkey, Noyes**

Personality development, learning, socialization, aging and major events in the human life cycle, considered in relation to developmental anatomy, physiology, endocrinology, genetics and biochemistry. For second-year students. Pre: consent of instructor.

650 Laboratory Diagnosis (2) II

Theory and practical application of indications for and significance of laboratory examinations, with special reference towards interpretation of results. Clinical case material will be utilized for instruction in basic techniques and demonstrations in hematology, immunohematology, clinical chemistry, serology and microbiology. Pre: consent of instructor.

Given jointly with department of pathology (See Path 650).

671-672 Clinical Conference (1-1) Yr.**Mamiya, Noyes, Shirkey, Blaisdell, Staff**

Presentation of patient-cases and discussion in depth by specialists, including visiting professors and non-clinical scientists with emphasis on multi-factoral determinants of illness, and the importance of quantitation in diagnostic and therapeutic evaluation. For second-year students, hospital housestaff and faculty. Pre: consent of instructor.

699 Research (arr.) I, II

Independent study in cardiology, endocrinology-metabolism, nuclear medicine, pulmonology, neurology, dermatology, nephrology, hematology, surgery, obstetrics-gynecology, pediatrics, radiology, and psychiatry. For first and second-year students. Pre: consent of instructor.

Section of Obstetrics and Gynecology (Ob-Gyn)

Professor NOYES; Associate Clinical Professors McCALLIN, NISHIJIMA, OHTANI, SAKIMOTO, TOM, VAUGHN, WONG; Assistant Professors KRIEGER, MCCORRISTON, NATOLI, SETO, TERADA; Assistant Clinical Professors BERGER, DUHRING, GOTO, HUNTER, LI, MATSUOKA, McCANN (Samoa), MUNDT, NAKAGAWA, NAKATA, OGAMI, OSHIRO, ROGERS, SAIKI, VALPEY; Instructors DAVI, NORDYKE, SPRAGUE; Clinical Instructors CHILD, HALE, HINDLE, LEE, ODOM, SHAW, TSEU, VU

The section of obstetrics and gynecology provides teaching in these disciplines for the introductory courses given by the department of medicine and assists hospitals and others in continuing medical education.

Pathology (Path)

Professors HOKAMA, NISHIMURA, SKINSNES; Associate Professors HABER, ROUNSEVILLE (Okinawa); Associate Clinical Professors STEMMERMAN, WILL; Assistant Professors BAER, LIPKOVIC, SAKURAI, UEMURA, YANG; Assistant Clinical Professors KELLEY, MCCARTHY, NAMIKI, PAIK; Assistant Researcher MOIKEHA; Instructor SPRAGUE; Clinical Instructors O'BRIEN (Okinawa), PLUMBO

Instruction in pathology is given to second-year medical students. The emphasis in the first semester will be general pathology which underscores important biologic events leading to reaction patterns of injury resulting from a variety of exogenous and endogenous etiologic factors. Systemic pathology, which is primarily concerned with the classification, causation and clinical correlation of diseases, will be taught in the second semester.

Elective courses in immunopathology and research are offered for advanced students and residents (M.D.) in specialty training (Pathology).

601 Human Pathology (4) I Nishimura, Skinsnes
General pathology. Biological response to injury from internal and external causes.

602 Human Pathology (4) II Nishimura, Skinsnes
Systemic pathology. Classification and clinical pathologic correlation of diseases.

649 Laboratory Diagnosis I (2) I Hokama, Yang
Mechanisms and practical laboratory analysis of the study of disease processes in experimental animal models. Pre: consent of instructor.

650 Laboratory Diagnosis II (2) II Haber, Uemura, Jim
Theory and practical application of indications for and significance of laboratory examinations, with special reference towards interpretation of results. Clinical case material will be utilized for instruction in basic techniques and demonstrations in hematology, immunohematology, clinical chemistry, serology, and microbiology. Pre: consent of instructor.

Given jointly with department of medicine (see Medicine 650).

670 Immunopathology Seminar (1) II Hokama
Autoimmune diseases and transplantation immunity. Pre: Micro 361 or 625 and Path 601.

699 Directed Research (arr.) I, II

Pre: consent of instructor.

700 Research in Pathology Residency Program (arr.) I, II

Selected topics. Pre: M. D. degree and residency in pathology in affiliated hospital.

Section of Pediatrics

Professors SHIRKEY, CHAR; Clinical Professors MARSHALL, WAXMAN; Associate Professors OOGHE (Okinawa), WIESE; Associate Clinical Professors CHOY, CHUN, L.T., ECKLES, EWING, HASEGAWA, KOBAYASHI, KOMETANI, NANCE, PEYTON, RICHARDSON (Samoa), SIA; Assistant Professor BINTLIFF; Assistant Clinical Professors BASS, CHANG, J., HAGINO, HO, R., NAGAO, NAKAMURA, OREN, REDDY, ROTH, SAKAMAKI, SEXTON, TOTTORI, M., WATT, P. F.; Clinical Instructors CASHMAN, CHING, Y., CHOAN, JOHNSTON, KAGIHARA, E. K. JR., KAYE, LONG (Okinawa), MERTZ, NAKATA, NATINO-BADUA, NEKONISHI, SOO, STEPHENSON, TOTTORI, H., WONG, R. J. C., YAMAOKA, YEE, A. B., YIM, H. L.

The section of pediatrics provides teaching in pediatrics, particularly for the introductory clinical courses and assists hospitals and others in continuing medical and paramedical education. It cooperates with other departments in fellowship training.

Pharmacology (Pharm)

Professors CUTTING, LUM, NORTON, SHIRKEY; Clinical Professor ANDERSON; Associate Professors CASARETT, CHOU, FURUSAWA, LENNEY, SHIBATA; Associate Clinical Professor TABRAH; Assistant Professors HATTORI, LI, PALMER, READ; Assistant Clinical Professors LEE, ROBERTS; Junior Pharmacologists CONKLIN, KASHIWAGI; Clinical Instructor REICHERT

The department of pharmacology offers the requisite work for medical students, and for the M.S. and Ph.D. degrees.

Intended candidates for the M.S. or Ph.D. in pharmacology must have or acquire adequate preparation in biology, chemistry, physics and mathematics. The course work required includes basic courses in related sciences, or demonstrated competence in these fields, plus other course work adapted to the needs of the particular students as determined by the major professor and the thesis committee. Most students will be expected to take graduate courses in biochemistry, microbiology, and genetics. Courses in pathology and clinical medicine will be recommended for some students.

600 Pharmacology: Actions and Uses of Drugs (5) II (3 L, 2 Lb) Cutting

Systematic consideration of the history, chemistry, actions, dangers, fates and uses of major classes of drugs in medicine. Adequate preparation in biology, chemistry, physics and mathematics.

610 Marine Pharmacology (1) II Baslow

Phylogenetic consideration of the potential of marine organisms for the production of new drugs. Emphasis is also placed on clinical aspects of intoxication and public health problems relating to the marine flora and fauna.

- 613-614 Seminar in Pharmacology (1-1) Yr.** **Lenney**
Reporting and discussion of current research in pharmacology.
- 615 Toxicology (4) I (3 L, 1 Lb)** **Casarett**
Basic description of toxicology according to systems and classes of substances. Principles of toxicology will be stressed in context with practical biomedical toxicological problems. Pre: consent of instructor. (Alt. yrs., offered 1969-70.)
- 616 Structure Action Relationships (3) II**
Study of relationship between chemical structure and biological activity with emphasis on chemical group modifications which either increase or decrease biological activity or toxicity. (Alt. yrs., offered 1969-70.)
- 617 Bioassay (4) I**
Study of biological methods utilized in estimation of endogenous and exogenous drugs and chemicals. Emphasis placed on extraction of normal body secretions, neurohormones, etc., as well as potency comparisons between synthetic chemicals with similar actions on given biological systems. Pre: 600. (Alt. yrs., not offered 1969-70.)
- 619 Experimental Pharmacodynamics (3) I**
Study of procedures using isolated organs or intact preparations, utilized in evaluation of biological properties of new drugs or chemicals. Included will be estimations of potency, effectiveness and sites of action. Pre: 600. (Alt. yrs., not offered 1969-70.)
- 631-632 Medicinal Chemistry (3-3) Yr.** **Norton**
Organic chemistry of substances of medicinal value based on chemical classification. Chemical and physical properties will be related to pharmacological action. Pre: organic chemistry.
- 634 Molecular Pharmacology (1) II** **Chou, Lenney**
Current knowledge regarding the action of drugs at the molecular level. Effects of drugs on cellular processes involving proteins, membranes, cell walls, and enzymes. Pre: biochemistry, physiology, and Pharm 600. (Alt. yrs., not offered 1969-70.)
- 699 Directed Research (arr.) I, II**
- 800 Thesis Research (arr.) I, II**

Physiology (Physl)

Professors HONG, ROGERS, WHITTOW; Clinical Professor BATKIN, Assistant Professors GILLARY, HAMPTON, MOORE, RAYNER; Junior Physiologist SETLIFF; Research Associates HAYASHI, SZEKERCZES

The department of physiology offers undergraduate courses as well as the requisite work for medical students and both the M.S. and Ph.D. degrees. Intended candidates for the M.S. or Ph.D. must have or acquire adequate preparation in biology, chemistry, physics, and mathematics. The course work required includes basic courses in related sciences, or demonstrated competence in these fields, plus other course work adapted to the needs of the particular student as determined by the major professor and the thesis committee. Most students will be expected to take graduate courses in physiology, pharmacology, and biochemistry.

- 89(99) Introduction to Human Physiology (5) I (3 L. 2 I.b)** **Hampton**
Primarily for associate degree candidates in the School of Nursing.

301 Elements of Human Physiology (4) I (3 L, 1 Lb) Rogers

Pre: 1 year of introductory zoology or biology, and introductory general and organic chemistry.

602 Medical Physiology (6) II (4 L, 2 Lb)

Comprehensive course for medical students and other graduate students. Pre: admission to medical school or consent of instructor.

603-604 Seminar in Physiology (1-1) Yr.

Discussion of current research in one or more areas.

605 Physiology of Nerve and Muscle (3) I

Rayner

Advanced course in the electrophysiology of nerve and muscle with emphasis on research techniques. Pre: 602, Psych 634, or consent of instructor.

606 Comparative Physiology of Thermoregulation (3) II Hampton, Whittow

Physiological and behavioral mechanisms by which the major groups of animals, including man, regulate their body temperature, heat production, and heat loss. Detailed study of sweating, panting, peripheral blood flow changes, metabolism and behavior and their control by peripheral receptors and the central nervous system. Evolutionary aspects of temperature regulation. Pre: 602 or equivalent.

607 Physiological Adaptation to the Environment (2) I (2 L)

Moore

Adaptive physiologic changes in response to acute or chronic alterations in environment, internal or external. Acclimation mechanisms from cellular level through whole organism. Pre: 602 or consent of instructor.

608 Advanced Renal Physiology (2) (2 L) II

Hong

Course will deal with the comparative anatomy of the kidney, evolutionary significance of renal function, cellular mechanisms of tubular transports, various techniques to study renal functions, and the role of the kidney in maintaining homeostasis. Pre: 602 or equivalent.

699 Directed Research (arr.) I, II**800 Thesis Research (arr.) I, II**

Section of Psychiatry (Psyty)

Professors CHAR, W., McDERMOTT; Associate Clinical Professors HANNUM, LUM, K. Y., MERTZ; Assistant Clinical Professors CODY, COLLIS, COTTINGTON, HAERTIG, HAUSCHILD, KEMBLE, LERNER, MOULON, POPE, ROAT, SAKAMAKI, SCHNACK, STEWART; Clinical Instructors DE TATA, ELIASHOF, HOWELL, RIVERA, ROCK, SCHRAMMEL, WATANABE

The section of psychiatry provides teaching, training, service and carries on research in the field of psychiatry.

607 Introduction to Human Behavior (2) I

Char, Staff

Appreciation that man is not only a physical being, but also a social and psychological entity. Genetic, biological, familial and social forces considered as well as endopsychic forces that shape the personality of man. Instruction coordinated with concurrent courses in the first year. For first-year students. Pre: consent of instructor.

616 Psychopathology (1) II

Char, Staff

Survey of psychiatric disorders. Emphasis on understanding genesis, psychodynamics and management. Instruction coordinated with concurrent courses in medicine, pathology and pharmacology. For second-year students. Pre: consent of instructor.

681 Cross-Cultural Psychiatry (1) II

Elective seminar in the cultural determinants of human behavior and illness. For second-year students. Pre: consent of instructor.

683 Psychosomatic Medicine (1) II

Elective clinic and seminar on coordinated clinical, psychological, and physiological approaches to the understanding and management of certain human illnesses, such as asthma, peptic ulcer, and hypertension. For second-year students. Pre: consent of instructor.

Section of Surgery (Surg)

Clinical Professors BATKIN, McDOWELL, PANG, WHELAN; Associate Professors GEBAUER, HONG (Okinawa), MAMIYA; Associate Clinical Professors CHINN, CHU, CLOWARD, FREEMAN, GORDON, HILL, KOKAME, LARSEN, PINKERTON, TANOUE, WATSON; Assistant Clinical Professors BURKHALTER, CRESSMAN, GULLEDGE, HATA, IRITANI, JIM, KOIKE, LAU, LEE, LOWREY, LUM, McDOWELL, MOOKINI, MORGAN, NELSON, PANG, PEYTON, ROBERTS, SANNAN (Samoa), SCULLY, SHIM, STRAEHLEY, WONG; Instructors MASON, YUN; Clinical Instructors BERGMANIS, BRAULT, CHALMERS, CHANG, C., CHANG, W., FAULKNER, FERNANDEZ, GOEBERT, HATTORI, HAY-ROE, IZAWA, JIM, KISTNER, LEE, MA, MORI, ODA, OISHI, OMURA, OSHIRO, PANG, RICHARDSON, SAKAI, SIMMONS, SMITH, SPRAGUE, TOM, TURNER (Samoa), WATSON (Okinawa), WON, WONG, YOUNG

The section of surgery provides teaching in surgery and the surgical specialties for the introductory courses in the department of medicine. Also, it provides surgical representation on medical school committees, facilitates research in surgery by the clinical faculty, and assists hospitals and others in programs of continuing medical and paramedical education.

Section of Tropical Medicine and Medical Microbiology (TrMed)

Professors BUSHNELL, DESOWITZ, HALSTEAD; Clinical Professor ROSEN; Associate Professor SIDDQUI; Associate Clinical Professor HATHAWAY; Assistant Professors DIWAN, STENHOUSE, YUEN; Assistant Clinical Professor WALLACE

The section of tropical medicine and medical microbiology provides instruction and carries on research in the field, including participation in the introductory courses in the department of medicine.

606 Tropical Medicine and Medical Microbiology (5) I

Halstead, Bushnell, Desowitz, Staff

Instruction in laboratory and principals of medical bacteriology, virology, immunology, mycology and parasitology for second year medical students.

SCHOOL OF NURSING

The School of Nursing offers programs to prepare students for professional nursing, technical nursing, and dental hygiene. The baccalaureate program in nursing began in September 1952 and the technical nursing program was founded in September 1964. The present two-year program in dental hygiene was inaugurated under the School of Nursing in 1961. The nursing programs are accredited by the Hawaii State Board of Nursing and the National League for Nursing. The dental hygiene program has been granted full approval by the Council on Dental Education of the American Dental Association. A bachelor of science degree is granted for completion of the undergraduate program in professional nursing. An associate of science degree is granted for work completed in the technical nurse program and a certificate is granted for the two-year program in dental hygiene.

A program leading to the master of science in nursing prepares graduates of accredited baccalaureate nursing programs for specialization in mental health-psychiatric nursing, community health nursing, and nursing in biophysical concepts. Preparation for administration or teaching in nursing may be planned on an individual basis.

Admission and Degree Requirements

Applicants for the baccalaureate degree in nursing program and the dental hygiene program must meet University admission requirements. Further selection is made on the basis of scores on selected tests, quality of high school and/or previous college work and references. Applicants for the associate degree program must have graduated from an accredited high school, and achieved a satisfactory score in college aptitude tests. Completion of a chemistry course and a life science course in high school is highly recommended. Women and men, married or single, may apply. Specific requirements for the bachelor of science degree in nursing, associate of science degree in nursing and certificate in dental hygiene are listed below.

BACHELOR OF SCIENCE DEGREE IN NURSING. Complete curriculum requirements and earn at least 140 credits with a grade-point average of at least 2.0 (*C*) and a grade of *C* or higher in each major course.

ASSOCIATE OF SCIENCE DEGREE IN NURSING. Complete curriculum requirements and earn at least 64 credits with a grade-point ratio of at least 2.0 and *C* or higher in each major course.

CERTIFICATE IN DENTAL HYGIENE. Complete curriculum requirements and earn at least 70 credits with a grade-point ratio of 2.0.

Academic Advising

The instructional staff of the School of Nursing and the personnel in the office of student services, Webster 415, are readily available for

students to talk about any matter impinging on educational progress.

Although faculty in each of the departments have the primary responsibility for advising students, the actual system varies with each department. In the department of technical nursing each faculty advises those students assigned to her laboratory section at least twice each semester. Dental hygiene freshmen are advised at least twice yearly and sophomores have at least six advisory conferences yearly with faculty. Each faculty member in the department of professional nursing is assigned four to eight students for the entire period that the student is in the program. As the student progresses from one course to another, faculty responsible for teaching the course also provide advising in conjunction with specific course requirements. Should a student not be able to contact her departmental adviser or because of the specific nature of her problem, she may go to the office of student services, Webster 415.

Professional Nursing Curriculum

Leading to Bachelor of Science in Nursing

The baccalaureate program in nursing offers a foundation in the liberal arts with a major in professional nursing. Its aims are to prepare students for beginning positions in all fields of nursing and to provide a sound basis for graduate study in nursing. The student graduates with a bachelor of science degree and is eligible to write the state examination for licensure as a registered nurse.

Pre-nursing students enroll in the College of Arts and Sciences and are admitted to the professional nursing curriculum at the end of the sophomore year upon completion of a minimum of 60 credits in the liberal arts, including the following:

General Requirements

English 100	3	
English 251, 252, 253, 254, 255, 256 (any two)	6	
Speech 145	3	
History 151-152, 161-162, 351-352	6	
Mathematics or Philosophy 210	3	
HPE—one activity course	1	
	<hr/>	
Elective	2	24

Pre-Nursing Requirements

Humanities—one course from either Group I or II	3
I. Phil 100, 200	
Rel 150, 151	
II. Art 101	
Music 160, 170, 265, 266	
S.S. 131, 132	

Social Sciences—all courses in group I; one semester course from group II	12
I. Psych 100 Psych 320 Soc 151	
II. Econ 120 Geog 102, 151 Pol Sci 110	
Natural Sciences—all courses in group I	21
I. Biol 220 Chem 113, 114; 115, 116; or 117, 118 Micro 130, 140 (lab offered 1st semester only) Zool 320	
II. Physics 160-161	36
	<hr/> 60

The upper division curriculum in professional nursing consists of five semesters of sequential nursing courses of increasing complexity, and continuing requisite and elective courses in Arts and Sciences. Students accepted into the program will complete upper division requirements as described in the next section.

Upper Division Requirements

At least 15 credits of non-introductory courses will be selected from the area requirements (I, II, III) listed below on the bases of relevance to the nursing major and the individual interests and long-range planning needs of students. Additional courses may be selected as electives (10 units). All students will complete requirements listed under IV Medical Science and V Nursing.

Area Requirements

I. HUMANITIES	3-10
Courses selected from: English, drama, history, philosophy, religion, art, music or languages in accordance with goals and interests of student.	
II. NATURAL SCIENCES	7-10
Courses selected from: biology, botany, chemistry, foods & nutrition, geology, physics, oceanography, genetics, micro-biology, physiology, zoology. Required: Food & Nutrition 385 (3) Physiology 301 (4)	
III. SOCIAL SCIENCES	3-10
Courses selected from: anthropology, psychology, sociology, economics, geography, political science. Required: Psych 113, Ed EP 429, or other equivalent course	
	15

IV. MEDICAL SCIENCE	9	
Medical Science 301-302 (3-3)		
Medical Science 401 (3)		9
V. NURSING	46	
Nursing 305-306 (6-6)		
Nursing 415-416 (8-8)		
Nursing 425 (12)		
Nursing 450 (3)		
Nursing 451 (3)		46
VI. ELECTIVES		10
		<hr/> 80

Program for Registered Nurses

Registered nurses who have completed the general and pre-nursing requirements listed above with a grade-point average of 2.0 or better may enroll in the professional nurse program. No advanced standing credit will be granted for nursing courses completed in a diploma or associate degree program. However, the University of Hawaii, in common with many other universities, allows students to take the regular University department examinations in courses in which it is deemed the student has had equivalent training.

A classified student who has a grade-point average of 2.4 or better and presents evidence to her college dean that she has had the equivalent of a course through experience or training but has not received college credit for the course may apply for credit by examination. (See "Credit by Examination.") Application must be made within the first six week period of a semester. Courses passed by examination do not carry grade-points although credit is granted for the course.

Technical Nursing Program

Leading to an Associate of Science Degree in Nursing

The program in Technical Nursing covers four academic semesters and leads to the associate of science degree in nursing. It consists of a minimum of 64 semester credits with a balance of general education and nursing course work. The last 12 credits in nursing must be taken in the department of technical nursing. The School of Nursing reserves the right to withhold the degree or to request the withdrawal of any student for any reason deemed advisable by the faculty.

Graduates of the program are eligible to take the state examination for licensure as a registered nurse. They are prepared for staff positions in hospitals, clinics, doctors' offices and private duty.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
Microbiology 130	3	English 100	3
Physiology 89	5	Psychology 320	3
Psychology 100	3	Sociology 151	3
Technical Nursing 53 (Basic Nursing)	5	Technical Nursing 54 (Nursing Science)	7
Total	16	Total	16

SECOND YEAR

THIRD SEMESTER		FOURTH SEMESTER	
	CREDITS		CREDITS
History	3	History	3
Speech 145	3	Technical Nursing 56 (Clinical Nursing)	8
Technical Nursing 55 (Nursing Science)	7	Technical Nursing 58 (Nursing Trends)	2
Elective	3	Elective	3
Total	16	Total	16

Two-Year Program in Dental Hygiene

Leading to a Certificate in Dental Hygiene

The program is planned to provide for the education and preparation required of the dental hygienist as a member of the dental health team for the rendering of professional preventive dental hygiene services and for educating the public in oral health.

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
Chemistry 113	3	Chemistry 141	3
Chemistry 115	1	Chemistry 142	1
Dental Hygiene 121	2	Dental Hygiene 140	1
Dental Hygiene 131	3	Dental Hygiene 150	1
English 100	3	Dental Hygiene 166	1
Physiology 89	5	Food & Nutrition 285	3
	—	Speech 145	3
Total	17	Elective	3
		Total	16

SUMMER SESSION*

	CREDITS
HPE 190	1
Psychology 100 or Sociology 151	3
	<hr/>
	4

SECOND YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
Microbiology 130	3	Dental Hygiene 270	3
Microbiology 140	1	Dental Hygiene 272	3
Dental Hygiene 251	2	Dental Hygiene 280	5
Dental Hygiene 267	2	Dental Hygiene 282	2
Dental Hygiene 269	2	Psychology 100 or	
Dental Hygiene 279	5	Sociology 151	3
Dental Hygiene 281	2		<hr/>
	<hr/>	Total	16
Total	17		

Dental Hygiene (DH)

Associate Professors AH MOO, NOBUHARA, (Clinical Supervising Dentists); Assistant Professor KOGA; Instructor LEE

121 and 131 prerequisite to all dental hygiene courses numbered over 131, and subsequent dental hygiene courses must be taken in sequential offering, except by special permission.

121 Introduction to Dental and Oral Hygiene (2) I

Orientation to profession; relationship of dental hygienist to dental hygiene and dentistry; role of hygienist in preventive dentistry.

131 Oral Anatomy and Tooth Morphology (3) I (3 L, 2 Lb)

Anatomy of teeth, bones of skull; muscles of mastication, tongue, face, pharynx; glands of oral cavity; cranial nerves, blood vessels of head and neck; laboratory procedures in drawing and carving of anterior and posterior teeth. Pre: Chem. 113, 115, Physl 89 or concurrent registration.

140 Introduction to Dental Prophylaxis Procedures and Techniques (1) II (1 L, 2 Lb)

Clinical instruction and practice on manikin; clinical application of operative technical procedures of instrumentation, polishing, charting on selected patients.

150 Introduction to Dental Histology and Embryology (1) II

Fundamentals of dental histology and embryology. Pre: Chem 113, 115, Physl 89.

*It is required that all students in dental hygiene complete the standard Red Cross First Aid course during the first year or by the end of that summer session. A copy of the Red Cross certificate must be filed in the office of the chairman of the department of dental hygiene.

166 Introduction to Human Pathology (1) II

Ah Moo

Basic causes, progress and termination of disease. Emphasis of defense mechanisms of body. Pre: 150 or concurrent registration.

251 Dental Histology and Embryology (2) I (2 L, 1 Lb)

Formation, structure and function of enamel, dentin, cementum, pulp, periodontium, alveolar process, gingiva. Pre: 150.

267 Oral Pathology (2) I

Ah Moo

Study of oral diseases of concern to dental hygienist. Pre: 166, 251 or concurrent registration.

269-270 Survey of Dentistry (2-3) Yr.

(269-2 L, 1 Lb) (270-3 L, 4-hr Lb)

Principles and procedures used in dentistry. Subject areas include dental materials, operative dentistry, prosthodontics, orthodontics, periodontics, pedodontics, endodontics, oral surgery, anesthesiology, practice management, dental assisting.

272 Dental Health Education and Dental Public Health (3) II

Principles of learning, dental health education as related to office, school, public health; methods, materials and practice in teaching; laws, ethics and economics involved; theory and practice of preventive dentistry with emphasis upon community dental health.

279-280 Dental Hygiene and Prophylaxis

(5-5) Yr. (3 L, 13-hr Lb)

Lee, Ah Moo, Nobuhara

Clinical experience in dental prophylaxis; topical application of fluorides; medical-dental history; oral inspection; charting; roentgenographs; patient education; emergency first aid.

281 Dental Roentgenography (2) I (2 L, 2 Lb)

Lecture-laboratory course in study, technique, use and application of roentgen ray to dentistry.

282 Pharmacology (2) II

Principles of pharmacology; considerations of drug groups; clinical therapeutics for dental hygienist.

Nursing (Nurs)

Professors ANDERSON, OLSON; Associate Professors BERMSOK, GROSS; Assistant Professors CHASE, FANCHER (on leave), KIM, LOVE; OZAKI, RODEWALD, SCHEINER, WHITE, FELTON; Instructors BEAVER, CARINO, COCKRILL, DECRISTOFARO, IWATA, KUBO, LETON, LOOMIS, NAKATSUJI, PUPOLO, SHIMAMOTO, WILLIAMS (on leave)

Registration is restricted to students preparing for nursing except by special permission.

305-306 Basic Nursing Science (6-6) Yr. Chase, Leton, Loomis, Nakatsuji, Puopolo

Overview of basic concepts and theoretical basis of nursing practice. Introduction to beginning skills in communication, interviewing, role identification, observation. Synthesis of knowledge from biological, natural, social sciences and humanities in understanding bio-psycho-social man and his pattern of daily living. Variety of community resources utilized for observation and laboratory study; 3 hours lecture and 9 hours laboratory weekly. Pre: acceptance in department of professional nursing or consent of instructor.

399 Directed Reading or Research (arr.) I, II

Cockrill

Limited to seniors and juniors in nursing.

- 415-416 Clinical Nursing Science (8-8) Yr.** Beaver, Carino, Cockrill, DeCristofaro, Iwata, Love, Shimamoto, Ivey
Orientation to analytical process for understanding, identification, solution of nursing problems; 4 hours lecture and 12 hours laboratory weekly. Pre: 305-306 or consent of instructor.
- 425 Nursing Leadership (12) I** Cockrill
Study of theoretical concepts basic to planning, organizing, implementing, evaluating nursing care of individual and groups of patients; understanding role of professional nurse in nursing and health teams; 4 hours lecture and 24 hours laboratory weekly. Pre: 415-416 and a statistics course or consent of instructor.
- 450 Nursing in the Changing Social Order (3) I** Kim
Study of social foundations of nursing practice. Focus on historical base, interpersonal, moral and legal ramifications of formal and informal components of social systems in which nursing is practiced.
- 451 Study of the Nursing Profession (3) II** Kim
Study of institutional, associational, societal aspects of professional nursing practice with emphasis on rights and obligations of professional status within nursing, between professionals and in relation to community. Pre: 450.
- 493-494 Senior Honors Thesis (2-2) Yr.** Cockrill
Preparation of research paper under individual faculty supervision. Required for graduation with honors. Pre: 399.
- 600-601 Methods of Research (3-3) Yr.** Olson, White
Basic knowledge of research process including formulation of meaningful problems in nursing and appropriate experimental design. Pre: statistics.
- 602 Orientation to Nursing Research (3) II** Olson
Critique of selected nursing research literature and evaluations of problem areas directed toward understanding concepts of systematic problem exploration and research contributions to nursing practice.
- 607 Nursing Practice Theory (3) I** Anderson, Felton
Study of selected conceptual models of nursing with particular emphasis on regulatory, adaptation, supplementary and complementary models.
- 610 Curriculum Development (3) II** Anderson
Development of philosophy and objectives for educational programs, curriculum design, content, teaching methods, evaluation.
- 611 Socio-Cultural Influences on Health and Health Services (3) I, II** Scheiner
Examination of socio-cultural influences on concepts of health and illness and on the nature of health practices.
- 615 Interaction Processes (3) I, II** Bermosk
Interviewing, interpersonal dynamics and communication theories related to nurse-patient interactions; process recording and process analysis. Lecture-discussion, student presentations, field work.
- 617 Nursing in Bio-Physical Pathology (3) I**
Examination of the fundamental principles and ideas necessary for forming a conceptual frame of reference for nursing.
- 621 Concepts of Leadership in Nursing (3) I, II** Olson
Concepts of behavioral sciences applicable to nursing leadership, development of leadership skills, effect of leadership styles on group development.

625 Advanced Nursing Concepts I (3) I, II

Exploration of advanced nursing concepts as they relate to:

(A) Mental health—psychiatric nursing: One to one relationship therapy. Pre: 607, 615, 655. **Bermosk**(B) Community health nursing. Pre: 607, 615, PH 609. **Gross**

(C) Administration of organized nursing services: legal, administrative and economic governmental influences as change agents. Pre: 607, 611, IS 600 or consent of instructor.

(D) Bio-physical pathology. Pre: 607, 615, 617. **Felton****627 Advanced Nursing Concepts II (3) I, II**

Continuation of Advanced Nursing Concepts I.

(A) Mental health—psychiatric nursing: Group therapy and family therapy. Pre: 625, 656, Psych 600. **Bermosk**(B) Community health nursing. Pre: 625. **Gross**

(C) Administration of organized nursing services: personnel management in nursing, organizations, contracts. Pre: 625.

(D) Bio-physical pathology. Pre: 607, 615, 617. **Felton****630 Advanced Nursing Seminar (2) II**

Seminar in a selected area:

(A) Mental health—psychiatric nursing. **Bermosk**(B) Community health nursing. **Gross**

(C) Administration of organized nursing services.

(D) Bio-physical pathology. Pre: fulfillment of prior requirements for major. **Felton****640 Advanced Nursing Practicum (4-6) II**

Concentrated study and field work in selected area:

(A) Mental health—psychiatric nursing **Bermosk**(B) Community health nursing **Gross**

(C) Administration of organized nursing services

(D) Bio-physical pathology. **Felton**

Pre: fulfillment of prior requirements for major.

655-656 Advanced Psychiatric Concepts (3-3) Yr.**Cody**

Theories of modern dynamic psychiatry related to personality development and functioning. Lecture, student presentations, participant observation. Principles of psychopathology, major mental illness and methods of treatment. Lecture, student presentations, participant observation.

699 Directed Study or Research (arr.) I, II**Olson**

Directed study of problem related to nursing theory and practice. Open only to 2nd-year graduate students.

Medical Science (MS)**301-302 The Individual and Illness (3-3) Yr.****Kubo, Rodewald**

Broad overview of major functional and structural changes which occur in health and illness; 2 hours lecture and 3 hours laboratory experience weekly. Pre: concurrent enrollment in Physiology 301 or consent of instructor.

401 The Individual and Illness (3) I**Kubo, Rodewald**

Broad overview of major functional and structural changes which occur in health and illness; lectures and seminars weekly. Pre: 302 or consent of instructor, (Offered jointly with the department of medicine.)

Summer Work Experience

During the summer an opportunity is provided for one or two second-year graduate students to participate in the Rural Community Mental Health Demonstration Project on the island of Maui as mental health-psychiatric nursing clinical specialists. Other opportunities for independent study and/or course work are provided in Honolulu as deemed appropriate for an area of concentration.

Technical Nursing (TN)

Associate Professor Aiu; Assistant Professors Boys (on leave), JOHNSON; Instructors BENNETT, BISHOP, GOO, HORTON

53 Basic Nursing (5) I

Basic principles of nursing and fundamental skills in patient care. Guided independent study and clinical experience; 3 hours lecture and 8 hours laboratory per week.

54-55 Nursing Science (7-7) Yr.

Man as a system of bio-psycho-social behaviors. Planning and giving nursing care in situations where there are disruptions of behavior in specific subsystems; 3 hours lecture and 12 hours laboratory per week in health agencies. Pre: 53.

56 Clinical Nursing (8) II

Synthesis and application of knowledge of behavioral subsystems of man in planning and giving nursing care. Opportunities provided in health agencies for students to identify patient problems and use appropriate nursing intervention; 4 hours lecture and 12 hours laboratory per week. Pre: 55.

58 Nursing Trends (2) II

Aiu, Johnson

Development of nursing and future trends, including socio-economic influences. To be taken concurrently with 56; 2 hours lecture per week.

SCHOOL OF PUBLIC HEALTH

The School of Public Health, one of 15 accredited schools of public health in the United States, received its accreditation in October 1965. It was established in July 1962 as a department of public health within the Graduate School (now Graduate Division). The School of Public Health is concerned primarily with maintaining and improving the general health of the community, and accordingly, offers graduate programs designed to prepare individuals who will (1) contribute to knowledge in the sciences pertinent to public health, or (2) actually perform public health services in the community, or (3) do both. Courses which give the student an appreciation of the broad field of public health are required, but each student's program may be tailored to emphasize an aspect of public health. Areas of emphasis include biostatistics, comprehensive health planning, environmental sanitation, epidemiology, health services administration, international health, maternal and child health, mental health, mental retardation, population and family planning studies, public health administration, public health education, public health engineering, public health laboratory and public health nutrition. All programs leading to degrees require PH 609-610 Public Health Organization and Administration (3-3); in addition, one or more of the following courses may be required: 655 Public Health Statistics (3), 663 Principles of Epidemiology (2), 681 Environmental Health (2).

Admission and Degree Requirements Leading to the Master of Public Health (M.P.H.) Degree

The M.P.H. degree program is designed to train persons for a variety of careers in the broad field of public health at local, state, national and international levels. In addition to meeting the admission requirements of the Graduate Division, candidates must have earned at least a bachelor's degree in a discipline appropriate to his chosen area of public health in which he plans to be employed. Depending on the candidate's background and interest, an appropriate course of study is prescribed, including courses in related fields, and incorporating the student's selected area of emphasis. Candidates must complete 30 or more semester hours and suitable field training approved by his program committee. A student must pass a general diagnostic examination on public health before formal admission to candidacy and must pass a final seminar appearance near the completion of his program.

Traditionally, M.P.H. candidates have been largely physicians, dentists, veterinarians or other personnel in the health or related professions with at least three years of experience; for these, the program may be completed in 12 months. The M.P.H. program at the University of Hawaii's School of Public Health is open not only to such experienced personnel but also to students who hold at least a bachelor's degree

with a minimum of 18 credit hours in the natural, social and behavioral sciences and who meet the academic requirements of the Graduate Division; for these, the program usually requires up to two years for completion. For further information, see the *Bulletin of the School of Public Health*.

Admission and Degree Requirements Leading to the Master of Science (M.S.) Degree

The M.S. program (Plan A and Plan B) is open to persons who meet the admission requirements of the Graduate Division, present at least a minimum of 18 credit hours in the natural, social and behavioral sciences in their under-graduate work, and desire research training in some specific aspect of public health (see above for areas of emphasis in public health). The Plan A program requires 30 or more semester hours including thesis research and, in some cases, some form of appropriate short-term field work. Plan B requires 30 or more semester hours and field training approved by the program committee and a final seminar appearance. Both programs may require up to two years to complete. For complete information, see the *Bulletin of the School of Public Health*.

Public Health (PH)

Professors BURBANK, CHUNG, CONNOR, GILBERT, GROSSMAN, LEE, SACHS, SCHWARTZ; Associate Professors ARMSTRONG, CLARK, CONWAY, DAVENPORT, DICKINSON, FURUNO, HANKIN, JENKINS, MATSUMOTO, MYTINGER, PARK, SMITH, VOULGARPOULOS, WOLFF; Assistant Professors BELL, EARICKSON, HAYAKAWA, STRINGFELLOW, SUEHIRO, YOUNG; Lecturers ALEXANDER, BERTELOTTI, GOTO, GOULD, KAU, TOKUYAMA, WIEDERHOLT

602 Seminar in Medical Care Organization (2) II Mytinger
Survey of medical care field, including considerations of needs, costs and organization in medical care; comparative medical care systems.

603 Organization of Medical Care Systems (3) I Mytinger
Introduction to organization of medical care services; need and demand for medical care and methods of financing medical care; national plans for medical care.

604 Institutional Health Care Facilities (3) II Conway
Principles and practices relating to organization and function of general and special hospitals and extended care facilities. Pre: concurrent enrollment in 605.

605 Non-Institutional Health Care Facilities (2) II Conway
Organization and function of ambulatory care services including clinics, group practices, home care services, disease detection programs, laboratory and pharmaceutical services. Pre: concurrent enrollment in 604.

606 Economics for Health Administrators (3) II
Economic analysis as basis for individual and social decision-making; supply and demand aspects of health and medical activities; health aspects of economic development. Pre: consent of instructor.

- 607 Seminar in Health Services Administration (1) I, II** **Mytinger**
Advanced study of current issues and problems. (1) Social and bureaucratic organization of medical care systems, (2) direction of health programs, (3) planning and integration of health services. May be repeated for credit. Pre: concurrent enrollment in courses pertinent to seminar emphasis.
- 609-610 Public Health Organization and Administration (3-3) Yr.** **Sachs, Staff**
609: Development of modern health movement; current organizational patterns and programs for developing and industrial countries. Interdisciplinary perspective introduce basic concepts of administration, biostatistics, epidemiology, environmental health, international health. Utilization of community resources in problem solving. **610:** Continuation of 609, featuring chronic disease, nutrition, mental health, maternal health, family planning, child health, the crippled child, mental retardation, social sciences as applied to public health. Further examples of use of community resources for a realistic solution to current public health problems.
- 611 Information Systems for Comprehensive Health Planning (2) II** **Earickson**
Study of type and significance of methods used for measurement, analysis, evaluation of health conditions; measurement of need, demand, use; problem identifications; prediction; anticipation and accommodation of change; evaluation of alternates; measurement and evaluation of results. Pre: consent of instructor.
- 612 Health Aspects of Physical Planning and Community Design (2) II** **Armstrong**
Environmental alteration and control; community response to environmental design; environmental stress; accident patterns; resources and environmental quality; housing; slums; urbanization; recreational spaces; aesthetics. Pre: consent of instructor.
- 613 Seminar in Comprehensive Health Planning (2) I, II** **Wiederholt**
Advanced study of health system as community sub-system. (1) Examination of goals and objectives, measurement and evaluation of results, priority determination in programming, policy formulation, resource allocation. (2) Examination of relationship of health system to total community systems. Pre: consent of instructor. May be repeated for credit.
- 616 Basic Concepts of International Health (3) I, II** **Voulgaropoulos, Staff**
Brief description of international health and health issues. Three main areas are covered in broad perspective. (1) development of international health and agencies; (2) socio-cultural, economic, political determinants of health; (3) health problems of developing nations of Asia and Pacific.
- 617 Comparative Public Health Systems (3) II** **Voulgaropoulos, Staff**
Review of health systems in selected countries and communities of Asia and Pacific. Emphasis on historical development and relevant socio-cultural, economic, political factors influencing development.
- 618 Seminar in International Health (2) II** **Voulgaropoulos, Staff**
Studies in health programming with emphasis on practical aspects of developing health programs and projects. Students assigned to on-going international program for in-depth study and field training.
- 624 Community Mental Health (2) II** **Schwartz**
Review of nature of community and individual mental health and of social and cultural forces influential in the incidence, prevention, or alleviation of community and individual mental illness.
- 629 Dental Public Health (2) II** **Kau**
Principles of conservation of oral structures and prevention of dental diseases through dental health programs. Pre: consent of instructor.
- 631 Public Health Nutrition I (2) I** **Hankin**
Principles of human nutrition underlying organization and administration of nutritional services in public health agencies.
- 632 Public Health Nutrition II (2) II** **Hankin**
Extension of 631. Organizing for and evaluating community nutrition programs.

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- 633 Seminar in Public Health Nutrition (1) I, II** **Hankin**
Specific nutrition problems in preventive medicine and public health. Pre: 631 or consent of instructor.
- 636 Medical Aspects of Disability (3) I**
Systematic presentation of medical conditions causing disability. Pre: consent of instructor. (Alt. yrs.)
- 642 Maternal and Child Health I (2) I** **Connor**
Basic principles and practices in maternal and child health programs.
- 643 Maternal and Child Health II (2) II** **Smith**
Advanced course in maternal and child health. Pre: 642.
- 644 The Handicapped Child (2) II** **Connor**
Problems and programs relative to children with handicapping conditions.
- 645 Principles of Comprehensive Maternity Care (2) I** **Smith**
Objectives and organization of comprehensive maternity care from public health viewpoint. Pre: 642 or consent of instructor.
- 646 Health Services for the Mentally Retarded (2) I** **Furuno**
Etiology, prevention, management, community programs for mentally retarded. Pre: consent of instructor.
- 649 Family Planning in Theory and Practice (2) I, II, SS** **Jenney**
Philosophy, techniques, organization of domestic and foreign family planning programs with concentration on practical problems of medical nature.
- 650 Demography and World Population Problems (3) II** **Matsumoto**
Introduction to study and description of human populations, including recent trends in world populations, analysis of projected trends. Pre: consent of instructor.
- 651 Fertility and Reproduction (2) II** **Goto**
Historical and contemporary methods of control of fertility. Pre: consent of instructor.
- 652 Staff Seminar in Population Dynamics (2) I, II** **Matsumoto**
Ecological considerations of factors involved in human population dynamics. Pre: consent of instructor.
- 655 Public Health Statistics (3) I** **Park**
Analysis, evaluation, interpretation, uses of statistics as related to public health problems. Pre: college algebra or equivalent or consent of instructor.
- 656 Biostatistics (3) I** **Park**
More theoretical treatment than 655 of elementary statistical concepts and methods of analysis of vital and health statistics. Pre: Math 134 or equivalent or consent of instructor.
- 657 Statistical Analysis (3) II** **Chung**
Extension of 655 and 656. Further treatment of estimation and tests of hypothesis, analysis of variance and covariance, multiple regression and correlation as related to public health problems. Pre: 655 or 656 or consent of instructor.
- 658 Seminar in Biostatistics (1) I, II**
Discussion of specific problems in biostatistics as related to public health.
- 663 Principles of Epidemiology (2) II** **Dickinson, Staff**
Basic epidemiologic principles, methods, their application with particular reference to geographic patterns of diseases in Pacific area. Pre: 655 or 656.
- 664 Infectious Diseases of Man in the Pacific Area (3) I** **Bell, Staff**
Systematic presentation of existing knowledge of important infectious diseases in Pacific area. Emphasis on public health rather than clinical aspects of each disease.

665 Public Health Aspects of Chronic Diseases (2) I, II**Sachs**

Discussion of major chronic diseases and application of epidemiologic and administrative principles to chronic disease screening, case-finding, control programs. Pre: Consent of instructor.

670 Socio-Cultural Aspects of Health and Illness (3) I, II**Wolff**

Public health practices and orientation in socio-cultural perspective. Pre: consent of instructor.

673 Educational Approach to Public Health (2) I**Clark, Grossman**

Consideration of socio-cultural and psychological factors involved in health education of the public; role of health worker as agent of planned change; principles, concepts, methods of public health education; theoretical considerations in development of educational activity.

674 Community Health Education Laboratory I (2) I**Hayakawa**

Field laboratory experiences correlated with content of 673. Emphasis on community study and analysis, particular attention to diagnosis of community health education problems, opportunities.

675 Group Methods in Public Health (2) I**Grossman**

Consideration of theory and practice of group development as educational component of community public health efforts. Lectures on theory of group processes and relevance to public health. Laboratory on group process analysis and application of theory to group problem solving.

676 Health Information Processes in Public Health—**Theory and Practice (2) II****Clark**

Philosophy and practices in health information aspects of public health program development; theoretical considerations from communication theory and research. Analysis and field testing of information media.

677 Educational Program Evaluation in Public Health (2) I**Davenport**

Unique aspects of educational evaluation in public health, consideration of evaluation as educational process; development of procedures for adequate educational data collection; function of evaluative efforts in program development.

678 In-Service Training and Staff Development**In Public Health (2) I****Bertellotti**

Theory and practice of training program development in health fields; analysis of training needs and methodologies; consideration of new approaches to manpower development in public health; design and testing of training materials and programs, special emphasis on public health and medical care settings.

681 Environmental Health (2) I**Burbank**

Characteristics of disease associated with environmental factors, means of transmission, principles of control of such communicable disease.

682 Vector Control in Environmental Health (3) II

Organization, administration, application of vector control methods in the control of diseases of environmental significance. Pre: 681 and consent of instructor.

683 Occupational Health I (2) II

Historical development of occupational health; occupational diseases and accidents; control of hazards in occupational environment; study of selected occupations and specific problems. Pre: consent of instructor.

685-686 Solid Waste Management and Control (3-3) Yr.**Burbank, Young**

Organization and operation of solid waste programs at federal, state, and local government levels. Reviews laws, ordinances, and regulations as well as relationship of solid waste disposal to air and water pollution control. Pre: completion of or concurrent registration in 681, CE 638, or consent of instructor.

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- 687 Sampling and Analysis of Solid Wastes (4) I** **Young**
Methods of sampling and analyzing solid wastes to determine their physical, chemical and bacteriological characteristics. Pre: concurrent enrollment in 685, consent of instructor.
- 688 Design of Solid Waste Disposal Facilities (4) II** **Burbank**
Design of storage, collection, transfer and disposal facilities for solid wastes. Pre: 685 and concurrent enrollment in 686 or consent of instructor.
- 696 Principles of Community Medicine (2) I** **Gilbert, Staff**
Public health-preventive medicine course open only to first-year medical students, taught in conjunction with introductory course in clinical correlation (Med 601) to examine the environmental and social roots of disease, stressing prevention where possible.
- 700 Management of Health Services (3) II** **Mytinger**
Principles and practices of managing health and medical institutions and programs. Pre: 603, 604 and 605.
- 701 Planning and Control of Health Services (4) I** **Conway**
Principles and methods of appraising, developing, allocating, financing, controlling medical resources, including area-wide and comprehensive planning. Pre: 700.
- 736 Seminar on Health of the School-Age Child (2) II**
Health needs of school-age child with particular emphasis on health problems which may present obstacles to learning process; role and responsibility of health personnel in working with these problems.
- 746 Techniques in Demographic Analysis (2) II** **Park**
Statistical methods of analysis of population data including construction of life tables, adjustment of rates, evaluation of census and vital statistics data, migrations, population projections, survey methods. Concurrent registration in 650 recommended. Pre: 655 or 656.
- 747 Statistical Methods in Epidemiological Research (3) II** **Chung**
Introduction to design, data processing, analysis of epidemiological studies of non-infectious diseases with emphasis on computer applications.
- 763 Advanced Community Health Education (2) II** **Grossman**
Program planning and development in community health education; theoretical considerations; current studies and research; educational dimensions of selected programs; local, state, national, international trends in planning and development.
- 764 Advanced Community Health Education Laboratory II (2) II** **Hayakawa, Davenport**
Field laboratory correlated with content of 763. Students participate in problem-solving activities related to planning, development, evaluation of educational components of community health action programs.
- 765 Advanced Seminar in Special Public Health Education Problems (2) I** **Clark**
Current research implications for educational activity in newly emerging fields of public health interest such as family planning, community mental health, accidental injury prevention, home care. Content varies with students' needs and interests and status of available literature. May be repeated for credit.
- 771 Environmental Control of Disease Through Food Protection (2) II**
Organization, administration, application of sanitary methods used to investigate and control food-borne diseases of environmental significance.

772 Environmental Factors in Health Problems (3) II**Young**

Introduction to air pollution, occupational disease, industrial hygiene; particular reference to common industrial processes, presence and recognition of hazards associated with them, evaluation of hazards; methods of determination of effectiveness of control measures. Pre: 681 and consent of instructor.

773 Measurement of Environmental Factors (3) II**Young**

Use of instrumentation for collection, identification and measurement of air pollutants and environmental hazards. Techniques for sampling and analysis of industrial atmosphere for dusts, mists, gases, fumes; interpretation of other physical measurements such as radiation, light, sound, noise. Pre: completion of or concurrent registration in 772 and consent of instructor.

786 Preventive Medicine (1) II**Gilbert, Staff**

Exploration of agencies and services available *outside the hospital* for prevention of disease and disability. Open only to second semester medical students, taught in conjunction with clinical courses; field trips, home visits required.

791 Advanced Public Health Practice in (Area of Emphasis) (3) I, II, SS

Observation, study and additional practical work in student's area of emphasis. (1) Biostatistics. (2) Comprehensive Health Planning. (3) Environmental Sanitation. (4) Epidemiology. (5) Health Services Administration. (6) International Health. (7) Maternal and Child Health. (8) Mental Health. (9) Mental Retardation. (10) Population and Family Planning Studies. (11) Public Health Administration. (12) Public Health Education. (13) Public Health Engineering. (14) Public Health Laboratory. (15) Public Health Nutrition. Pre: consent of instructor.

792 Seminar in Public Health (1-5) I, II, SS

Advanced seminar in selected public health topics. (1) Biostatistics. (2) Comprehensive Health Planning. (3) Environmental Sanitation. (4) Epidemiology. (5) Health Services Administration. (6) International Health. (7) Maternal and Child Health. (8) Mental Health. (9) Mental Retardation. (10) Population and Family Planning Studies. (11) Public Health Administration. (12) Public Health Education. (13) Public Health Engineering. (14) Public Health Laboratory. (15) Public Health Nutrition. Pre: consent of instructor. May be repeated for credit.

799 Directed Reading Research (arr.) I, II, SS

Pre: consent of instructor.

800 Thesis Research (arr.) I, II, SS

Pre: consent of instructor.

SCHOOL OF SOCIAL WORK

The School of Social Work offers a two-year graduate program leading to the M.S.W. degree. It also offers courses on the undergraduate and preprofessional levels for juniors and seniors. Each student is assigned a faculty adviser. The function of the adviser is to help the student plan his program to bring about maximum coordination and use of class and field curriculum in order to enhance the student's total educational experience.

The School operates the Youth Development Center (see "Research and Service Operations"). The School was started in 1940 and received accreditation from the Commission on Accreditation of the Council on Social Work Education in 1950. For specific information on admission and degree requirements write: School of Social Work, 1395 Lower Campus Rd., Honolulu, Hawaii 96822.

Social Work (SW)

Professors APTEKAR, FISHER, JAMBOR, KURREN, PARAD, POLEMIS, SIKKEMA, TAKASAKI, WALSH; Associate Professors MERRITT, NAGOSHI; Assistant Professors ASATO, CAULFIELD, CHUNG, HARTMAN, HOOVER, ISHIMOTO, KUMABE, ROSEN, TAKASE, TYSON, VERDEYEN, WOODRUFF; Lecturers MORRIS, SCHNACK

GRADUATE PROGRAM

- 605 Social Casework (2) I** Hartman, Kumabe
Introduction to basic principles and processes of social casework.
- 606 Social Casework (2) II** Hartman, Kumabe
Continuation of 605. Emphasis upon diagnosis and skill in treatment of casework problems. Concurrent with 660-661. Pre: 605.
- 608 Social Group Work (2) I** Asato, Fisher, Rosen
Introduction to basic principles and processes of group work.
- 609 Social Group Work (2) II** Asato
Continuation of 608. Emphasis upon understanding individual in groups and skill in use of helping process. Concurrent with 660-661. Pre: 608.
- 610-611 Human Behavior and the Social Environment (3-3) Yr.** Walsh
Designed to provide synthesized understanding of physical, mental, emotional growth; due regard to social and cultural influences on individual development.
- 612 Group Work Program Activities (1-1) Yr.**
The program as tool in meeting individual and group needs. To be taken concurrently with 660-661. (Not offered 1969-70.)
- 615 Community Organization (2) II** Jambor
Methods and processes of community organization in social work.
- 626 Treatment of Juvenile Delinquency (2) II**
Social work practice in relation to problems of juvenile delinquency.
- 627 Social Services (2) I** Morris, Sikkema
Study of social welfare policy and services with particular attention to poverty and income maintenance programs.

628 Social Services (2) II

Morris, Sikkema

Range of services designed in relation to problems and needs, the historical development of services, issues of program organization, philosophies of governmental and voluntary responsibility.

652 Social Research and Statistics (2) II

Polemis

Problems and procedures in research related to social work.

653 Legal Aspects of Social Work (2) I

Jambor

Problems in judicial administration and substantive law in relation to human problems and social welfare programs.

656 Social Welfare—Its Organization and Administration (2) I

Principles and problems of social agencies with respect to structure and operation.

660-661 Supervised Field Work (3-3) Yr.

University units in public and private agencies. Concurrent with method course (casework, group work, or community organization). Limited to full-time students.

760-761 Advanced Supervised Field Work (4-4) Yr.

To be taken concurrently with advanced course in social work method (casework, group work, or community organization). Limited to full-time students.

764 The Social Caseworker and the Use of Group in Treatment (2) II

Fisher

Guidelines for caseworker with client groups. Consideration of similarities and differences in casework and group work methods. Pre: 3 semesters of work in School of Social Work leading to M.S.W. degree. Consent of instructor.

765 Advanced Social Casework (2) I

Kumabe, Walsh

Case discussion of generic casework concepts as applied in work with emotionally disturbed individuals. Concurrent with 760.

766 Seminar in Social Casework (2) II

Kumabe, Walsh

Analysis and evaluation of case material contributed from student's experience and selected records.

767 Casework with Children (2) I

Casework concepts in care of children. Pre: 765, consent of instructor.

768 Seminar in Rehabilitation (2) II

Problems of rehabilitation and role of social work in this area.

770 Advanced Social Group Work (2) I

Fisher

Further emphasis on the needs of individuals in groups; analysis of the group worker's activity in groups with a treatment focus. Concurrent with 760.

771 Seminar in Social Group Work (2) I

Fisher

Analysis and evaluation of case material contributed from student's experience and selected records. Presentation of papers on current issues in group work. Study and assessment of various models for work with groups.

775 Advanced Social Psychiatry (2) I

Schnack

Dynamics of behavior in neuroses and in functional and organic psychoses, with emphasis on current treatment processes.

777 Community Development and Social Work (2) II

Jambor

Organized efforts to improve conditions in community life; capacity for community integration and self-direction. Principles and practice of community development in newly developing countries; particular reference to contributions and relationships of social work to these programs.

780 Administrative Methods in Social Work (2) I

Administration of social welfare agencies with emphasis upon relationship between structure and function.

781 Seminar in Social Welfare Policy Work (2) II

Jambor, Sikkema

Basic problems and policies in major fields of social welfare.

- 785 Methods of Supervision in Social Work (2) II** Hartman
Supervision in social work as it relates to casework and group work. Open to agency workers who are potential or actual supervisors. Pre: consent of instructor.
- 787 Current Practice in Community Organization (2) II**
Consideration will be given to recent trends toward citizens' councils, health committees, and regional councils in both public and private welfare fields. Pre: 615.
- 790 Cultural Factors in Social Work Practice (2) II** Merritt, Sikkema
Significance of psychocultural factors in personality development and behavior. Pre: 611.
- 791 International Social Work (2) II**
Present trends in international social welfare programs of selected countries. Given occasionally.
- 798-799 Seminar in Research (3-3) Yr.** Jambor, Kumabe, Merritt, Polemis
Principles of objective fact-finding, primary and secondary sources of social data; preparation of a report or thesis.

UNDERGRADUATE PROGRAM

The School of Social Work offers the following courses on the undergraduate level (Pre: junior standing).

- 300 The Field of Social Work (3) I** Ishimoto
Non-professional orientation course intended to acquaint student with philosophy, scope, aims of social work. Pre: junior standing.
- 301 Social Welfare as a Social Institution (3) II** Ishimoto
Purpose and philosophy governing establishment and operation of social welfare programs. Interrelationship of social, cultural, political, economic factors in development of social welfare. Junior standing.
- 305 Community Planning and Development in Social Welfare (3) II** Nagoshi
Current trends in community welfare planning programs. Material from fields of social work, sociology, social psychology, others. Pre: 300-301 (or with consent of instructor concurrently with 301.)
- 315 Social Work Methods (3) I** Ishimoto
Analysis of techniques most commonly used in social work practice. Casework, group work, community organization, administration, research. Open to seniors. Pre: 300-301.
- 320 Social Work with Juvenile and Adult Offenders (3) I** Nagoshi
Study of social welfare resources and institutions for treatment of offenders. Pre: 300-301.
- 335 Seminar in Social Welfare (3) II** Ishimoto
Designed to coordinate and integrate social welfare concepts with practice. To be taken concurrently with 340. Pre: 315.
- 340 Field Experience (2) II** Ishimoto
Short-term experience in a social agency with opportunity to observe and participate in agency service at appropriate level. To be taken concurrently with 335.

College of Tropical Agriculture

THE COLLEGE OF TROPICAL AGRICULTURE prepares students for professional work in agriculture and human resources development. There are 3 curricula in agriculture: agricultural technology, agricultural economics, and agricultural science. Agricultural technology has two options—general and tropical crop production. Agricultural science has four options—entomology, animal sciences, soil science, and tropical horticulture. Agricultural economics has two options—agricultural economics and agricultural business.

Four curricula are offered in human resources development: fashion design, textiles and merchandising, home economics, food and nutritional sciences, and human development.

All curricula lead to the bachelor of science degree.

The establishment of the College of Agriculture was approved in principle by the board of regents on December 7, 1944. Its name was changed to the College of Tropical Agriculture in February 1960.

The College also includes the Hawaii Agricultural Experiment Station and the Cooperative Extension Service in Agriculture and Human Resources Development.

Admission and Degree Requirements

The requirements for admission are the same as those for the University. Students who lack some of this required preparation are unable to follow the regular programs and may need more than four years to complete the degree requirements.

To be eligible for the degree a student must:

1. Complete the general requirements prescribed by the University (pp. 53-56);
2. complete the course requirements of a curriculum;
3. have a 2.0 grade-point ratio for all registered credits.

CURRICULA IN AGRICULTURE

The program is designed to give a knowledge of the fundamental principles underlying agriculture as a science, and to prepare for effective service in research, teaching, business, and industry, as well as in practical farming.

In addition to the general University requirements in communications, quantitative reasoning, world civilization, humanities, natural sciences and social sciences, the College requirements include a basic core consisting of Ag 100, AS 141, Hort 262, Ag Econ 220, Ent 161 and Soils 304. Curricular requirements are:

1. **AGRICULTURAL TECHNOLOGY:** Ag Eng 331, Agron 310, Ent 372, Hort 450, PPath 410, Soils 350. In Mechanized Agricultural Production, 18 credits from above or Agronomy 201, 411, 412.

(a) in the General Agriculture option: 18 credits from agronomy, agriculture, ag engineering, animal sciences, botany, plant sciences; 18 credits from humanities, social sciences, HPE.

(b) in the Mechanized Agricultural Production option: Ag Eng 332, 342, 344, 431, 432, 435; GE 109; Ag Econ 434; 21 credits from the following: Ag Eng 442; Ag Econ 327; BAS 111, 315, 321; Soils 460; CE 270, 320, 421, 424; EE 303, 304, 305; GE 251; ME 312, 331, 371, 467; Math 205, 206, 231, 232.

2. **AGRICULTURAL SCIENCE:** Chem 243, 245; Chem 244, 246 or Ag Biochem 402, 403, Genet 451; Phys 160, 161; Micro 351 and

(a) in the Animal Science option: AS 241, 341; 9 credits from AS 342, 343, 344, 345, 346; Zool 320; 16 credits from Ag Biochem 402, 403; Ag Econ 327; Ag Eng 331; Agron 201, 413; AS 442, 443, 444, 445, 446; Chem 133; Econ 150; Ent 372; Zool 340, 416, 417, 430.

(b) in the Entomology option: Ent 361, 362, 372; one year of a foreign language: German, French, Spanish, Japanese or Russian; 15 credits from Ag Eng 331; Bot 105, 353, 360, 470; Chem 133; Geog 300, Hort 450, 453; Phil 210; PPath 410; Soils 340, 350; Zool 330, 340, 416, 417, 430, 631, 632.

(c) in the Soil Science option: Chem 133; Soil 340, 350, 499, and 18 credits from Agron 201, Ag Eng 435; Bot 160, 201, 353, 470; Chem 432, 351-352; Geog 101, 300, 375; Geo Sc 101, 102, 301; Hort 450; Math 205, 206; Phil 210; Soils 460; Zool 631, 632.

(d) in the Tropical Horticulture option: Hort 450 and 28 credits from the following: Ag Biochem 402, 403; Ag Eng 331, 435; Bot 105, 160, 201, 353, 410, 412, 454, 461, 470, 480; Chem 133; Ent 161, 372; Hort 350, 450, 453, 471, 481; Math 205, 206; PPath 410; Soils 340, 350. One year of a foreign language approved by adviser.

3. AGRICULTURAL ECONOMICS: Econ 150, 151, 301, 340; Acc 201; PolSc 110; Ag Econ 321, 322, 327, 428, 429, 432, 434 and

(a) in Agricultural Business options: Elementary accounting 201, 202; marketing & foreign trade elective; Law 300; Ag Econ 423, 427, 430 and two electives from econ, business, ag engineering.

(b) Agricultural Economics option: seven electives from agronomy, economics, business, ag engineering.

AGRICULTURE COURSES

See pp. 4-5 for a discussion of course descriptions.

Agriculture (Ag)

Associate Professor S. GOTO; Lecturer G. SUSSMAN

100 Agriculture Orientation (1) I **Goto**
Lectures and field trips to acquaint student with background of agriculture and to help him select major.

299 Agricultural Practice (2) I, II, SS **Goto**
Agricultural practice on projects at Pearl City facility. May be repeated.

310 Community Action Program (3) II **Sussman**
Dynamics and structure of community action; case studies of international and Hawaiian programs.

399 Agricultural Thesis (arr.) I, II, SS **Staff**
Advanced individual work in field, laboratory, library. Limited to senior majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in agriculture.

401 Introduction to Cooperative Extension Work (3) II
Objectives and organization. Methods, selection, training of voluntary leaders; basic principles in program development and appraisal.

Agricultural Biochemistry (AgBio)

Professor MATSUMOTO; Associate Professor HYLIN

402 Principles of Metabolism (3) I, II
Study of fundamental processes common to all living organisms. Pre: Chem 117-118 or 113-115, 114-116, and 241-242, or consent of instructor. Approved for graduate credit.

403 Principles of Metabolism-Laboratory (1) I, II
This laboratory course may not be taken without lectures (402).

Agricultural Economics (AgEc)

Professors DAVIDSON, ISHIDA, PHILIPP, SCOTT; Associate Professors KEELER, LARSON, MYRICK, SPIELMANN; Assistant Professors BOYER, RENAUD, YAMAUCHI; Lecturers BAKER, CERTEL, HOGG, WALLRABENSTEIN

- 220 Agricultural Economics (3) I** Myrick
Introduction to economics of agricultural production, marketing, prices, income, policy. Includes government policy and program related to agriculture, land use, farm tenancy, socio-economic problems of farmers in nation and world.
- 321 Agricultural Prices (3) II (2 L, 1 Lb)** Spielmann
Factors affecting prices of agricultural products; evaluation of governmental price policy. Pre: course in economics.
- 322 Marketing Agricultural Products (3) II (2 L, 1 Lb)** Ishida
Problems, agencies, functions, costs, prices, regulations affecting marketing; proposed improvements. Pre: introductory course in economics or consent of instructor.
- 327 Farm and Ranch Management (3) I (2 L, 1 Lb)** Keeler
Principles of organization and management of individual farms and ranches; choice of enterprises; farm planning; budgeting; business aspects; records; farm and plantation visits.
- 399 Directed Study (arr.) I, II** Staff
Limited to exceptional undergraduate students qualified to carry on advanced study. Pre: consent of instructor.
- 410 Introduction to Quantitative Methods in Agricultural Economics (3) I** Larson
Mathematics applied to economics. College algebra, analytical geometry, calculus; introduction to matrix algebra. Examples drawn from agricultural economics. Pre: Math 134 or consent of instructor.
- 423 Agricultural Cooperatives (3) II** Ishida
History; appraisal of methods and operations; problems of management, membership relations, accounting. Pre: 322 or consent of instructor. (Alt. yrs.; offered 1969-70.)
- 424 Marketing of Tropical and Subtropical Agr. Products (3) II** Scott
Marketing system and market analysis for sugar, rice, pineapple, coffee, citrus, other tropical and subtropical crops. Pre: 220, 322 or consent of instructor. (Alt. yrs.; offered 1969-70.)
- 425 Marketing of Livestock, Poultry and Dairy Products (3) II** Staff
Marketing systems and market analysis for livestock, poultry and dairy products. Pre: 322 or consent of instructor. (Alt. yrs., not offered 1969-70.)
- 427 Management of Agri-Business Firms (3) II** Ishida
Basic principles of management. Problems encountered in management of co-operative and non-cooperative business firms directly or indirectly related to the agricultural economy, management structure and performance of food processors, agricultural supply businesses and various other agriculture related organizations will be discussed and analyzed. Pre: 321 or consent of instructor. (Alt. yrs.; offered 1969-70.)
- 428 Production Economics (3) I** Hogg
Economic analysis of agricultural production, including theory of firm, resource allocation, production and cost functions, input-output analysis, farm size, enterprise combinations, tenure arrangements, risk, decision making. Pre: Econ 301, 327 or consent of instructor.
- 429 Agricultural Policy and Planning (3) II** Spielmann
Roles of government and private enterprise in agriculture. Pre: Econ 150-151, or consent of instructor. (Alt. yrs.; offered 1969-70.)

430 Agricultural Finance (3) II

Staff

Financing of agricultural production and marketing enterprises, operation of agricultural credit systems in the U.S. and developing countries of Asia. Pre: 327 or consent of instructor. (Alt. yrs.; offered 1969-70.)

432 Introduction to Natural Resource Economics (3) II

Staff

Economic principles involved in the efficient utilization and management of natural resources—e.g., marine resources, water, land, timber, etc. Pre: Econ 151 or consent of instructor.

433 Advanced Management and Plantation Economics (3) II (2 L, 1 Lb)

Keeler

Advanced work in management and organization of commercial farms; farm business analysis; plantation economics. Pre: 327 or consent of instructor. (Alt. yrs.; not offered 1969-70.)

434 Statistical Methods (3) I

Larson

Principles and methods of statistical analysis. Frequency distributions, probability, tests of significance, confidence intervals, regression and correlation, analysis of variance. Applications to agricultural economic research.

435 Economics of Food Distribution (3) I

Boyer

Major emphasis on food store management. Supervision and development of personnel. Cost control, inventory control, customer service, records and reports, community relations and store maintenance will also be emphasized. Pre: 322, 326 or consent of instructor. (Alt. yrs.; offered 1969-70.)

470 Regional Economic Analysis (3) I

Renaud

Introduction to location theory and regional economic analysis. Included are studies in regional structure location theory and land use, regional accounts and income analysis, input-output and related models, etc. Pre: 321 or Econ 300.

480 Computer Programming in Agricultural Economics Research (3) II

Larson

Computer programming: Fortran. Prepared programs. Basic concepts of matrix algebra, regression analysis, linear programming. No prerequisite.

624 Research Methodology (3) I

Davidson

Philosophical setting for scientific inquiry, scientific method and its antecedents, application in agricultural economics research. Original research project required. Pre: graduate standing. (Alt. yrs.; not offered 1969-70.)

625 Economics of Agriculture: Tropical Countries and Asia (3) I

Staff

Agricultural development, economics of agricultural technology, resource utilization, comparative advantage, international and intra-country marketing problems, institutions affecting agricultural economy. Pre: Ag Econ 220 or consent of instructor.

626 Collection of Economic Data in Agriculture (3) II

Wallrabenstein

Methods of collection of agricultural data for regular programs and for special purposes. Pre: 434 or consent of instructor.

629 Advanced Production Economics (3) II

Staff

Economics of resource allocation at firm and industry levels. Advanced analytical techniques of analysis: linear programming; synthesis; budgeting; statistical analysis. Pre: 428, 480 or consent of instructor.

630 Market Development for Agricultural Products (3) II

Scott

Methodology for determining market potentials; methods and costs of market development for products of agricultural origin. Pre: 322 or consent of instructor. (Alt. yrs.; offered 1969-70.)

634 Advanced Agricultural Prices and Statistical Analysis (3) I

Renaud

Research methodology in analysis of agricultural prices and other statistical data in agriculture, including techniques for estimating prices and determination of factors affecting prices. Pre: 434, 480 or basic course in statistics.

- 635 Seminar: Agricultural Price Analysis and Statistics (3) I** **Larson**
Selected topics in application of statistics to research in agricultural production and marketing. Pre: 634 or consent of instructor. (Alt. yrs.; not offered 1969-70.)
- 636 Seminar: Agricultural Policy (3) II** **Spielmann**
Economic analysis of agricultural policy at state, national, international levels; particular reference to influence of policy on economic development in agriculture. Pre: 429 or consent of instructor. (Alt. yrs.; not offered 1969-70.)
- 637 Resource Economics (3) II** **Yamauchi**
Analysis of problems of development and management of natural resources with emphasis on resources in agriculture and role in economic development. Pre: 428, 432, or consent of instructor. (Alt. yrs.; offered 1969-70.)
- 638 Seminar: Land Use in Developing Countries (3) II** **Gertel**
Role of land use pattern on agricultural economic development and welfare of rural people in emerging agricultural nations. Pre: 432 or consent of instructor. (Alt. yrs.; not offered 1969-70.)
- 639 Agricultural Development Economics and Development Planning (3) I** **Staff**
Theories of agricultural development, agriculture in total development process; formulation of agricultural development plans and policies. (Alt. yrs.; not offered 1969-70.)
- 680 Rural Sociology and the Agricultural Economy (3) I** **Marders**
Social factors influencing economic processes related to agriculture; diffusion of innovations in rural societies.
- 699 Directed Research (arr.) I, II** **Staff**
Pre: consent of instructor.
- 701 Seminar in Agricultural Economics (arr.)** **Staff**
Topics of current interest and current research related to agricultural production, marketing, statistics, rural sociology, development and policy.

Agricultural Engineering (AgEng)

Professors KINCH, WANG; Associate Professors GITLIN, STRUNK; Assistant Professors LIANG, WU; Instructor SHELLENBERGER

- 331 Mechanizing Food Production (3) I** **Shellenberger**
Significance of mechanization in the growth of food production industries. Importance and application of power units and machines in modern agriculture. Pre: Math 134.
- 332 Engineering Application in Food Production (3) II** **Shellenberger**
Introduction to principles and applications of farm structures, crop processing, surveying and irrigation in the production and handling of agricultural products. Pre: 331.
- 342 Junior Project (1) I** **Staff**
Construction and testing of agricultural equipment components. Individual or group projects. Pre: junior standing in MAP or consent of instructor.
- 344 Senior Project (1) II** **Staff**
Construction and testing of agricultural equipment components. Individual or group projects. Pre: senior standing in MAP or consent of instructor.
- 431 Agricultural Power (3) I** **Kinch**
Principles of operation, maintenance, repair and power measurement of gasoline and diesel engines. Farm tractor selection, power measurement, safety and study of the tractor's power transmission components. Pre: 332.

- 432 Agricultural Implements (3) II** **Kinch**
 Fundamentals of operation of agricultural machinery. Integration of power and equipment on plantation, ranch, farm; methods of evaluating capacity, efficiency, cost. Pre: 431.
- 435 Irrigation Principles and Practices (3)** **Wu**
 Basic principles of irrigation science with applications to irrigation methods; water conveyance, distribution, measurement; water requirements of crops; irrigation efficiency and cost. Pre: 331 or consent of instructor.
- 442 Handling, Storage and Processing Equipment (3) I** **Wang**
 Precooling, cold storage, drying, bulk handling, and physical damage to agricultural products. Pre: 331.
- 631 Analysis of Implement Design (3) I** **Kinch**
 Application of machine design principles and basic soil, crop requirements in solving typical equipment design problems. Pre: ME 468 or equivalent.
- 635 Farm Irrigation System Design (3) II** **Wu**
 Design based on water requirements; design of water conveyance and diversion structures and of application methods. Irrigation economics. Pre: CE 421 or equivalent.
- 647 Methods of Agricultural Engineering (3) I** **Wang**
 Study of mathematical tools of agricultural engineering, including dimensional analysis, model studies, queuing theory, boundary value problems and application to theory of drying and vibrations of elastic bodies. Pre: Math 402.
- 648 Post-Harvest Process Engineering (3) II** **Wang**
 Advanced topics in heat transfer; forced convection, condensing vapor, boiling liquid; physical properties of agricultural products; design of pre-cooling systems. Pre: ME 422, Math 402.
- 699 Directed Research (arr.) I, II** **Staff**
- 700 Seminar (1) I, II** **Wang**
 Review of recent literature. Pre: consent of instructor. May be repeated once.

Agronomy and Soil Science

Senior Professor G. D. SHERMAN; Professors EKERN, FOX, SANFORD, SWINDALE; Associate Professors GREEN, KANEHIRO, ROTAR, UEHARA, YOUNG; Assistant Professors BARTHOLOMEW, EL SWAIFY, IKAWA, JONES, SILVA, URATA

Agronomy (Agron)

- 201 Principles of Tropical Agronomy (3) I (2 L, 1 Lb)** **Bartholomew**
 Relation of plants, nutrients, environment, cultural practices to field crop production. Emphasis on tropics. Pre: Bot 101, Chem 114.
- 310 Tropical Crop Production (3) I** **Rotar**
 Current agricultural practices in production of food, feed, and fiber crops in the tropics. Pre: 201 or equivalent.
- 411 Sugar Cane Agronomy (3) II** **Silva**
 Cane plant; breeding, physiology, culture, growth, harvesting, milling, marketing; field practices and management; international agreements. Pre: Soils 304 or consent of instructor.

- 412 Pineapple Culture (2) II** **Sanford**
 Historical development of pineapple culture around world. Morphological and physiological peculiarities of pineapple plant. Agronomic practices used in pineapple culture in Hawaii. Pre: consent of instructor. (Alt. yrs., not offered 1969-70.)
- 413 Pasture Management (3) II** **Rotar**
 Origin, establishment, inventory, utilization, management of pasture and range forage. Emphasis on applications in tropics. Pre: Bot 101. (Alt. yrs.; not offered 1969-70.)
- 610 Physiology of Crop Production (3) I** **Bartholomew**
 Physiological principles underlying development and production of crop communities. Topics include establishment of crop, population and distribution effects, energy and nutrient supply, energy transport and storage and aspects of regrowth. Pre: Bot 470 or consent of instructor.
- 621 Breeding of Asexually Propagated Crops (2) II** **Urata**
 Breeding of asexually propagated perennial species, including sugar cane, pineapple, tropical forage grasses, with special emphasis on genetical, cytological, evolutionary principles involved. Pre: Genet 451 or consent of instructor. Hort 453 recommended.
- 699 Directed Research (arr.) I, II** **Staff**
 Pre: candidacy for M.S. degree.
- 701 Seminar in Advanced Agronomy (1) I** **Staff**
 Review of recent research findings in tropical agronomy. Pre: graduate standing.
- 710 Mineral Nutrition of Tropical Crops (2) I** **Sanford**
 Mineral nutrition of plants in relation to mechanisms of ion transport, salt absorption, plant metabolism. Special emphasis on problems associated with tropical crops. Pre: Bot 470; Soils 350. (Alt. yrs., offered 1969-70.)

Soil Science (Soils)

- 304 Tropical Soils (4) I (3 L, 1 Lb)** **Ikawa**
 Origin, development, properties, management of tropical soils; classification of Hawaiian soils. Pre: Chem 114.
- 340 Soil Chemistry (3) I (2 L, 1 Lb)** **Kanehiro**
 Study of soil reaction, availability of plant nutrients, chemical analyses of soils. Pre: 304.
- 350 Soil Fertility (3) II** **Fox**
 Nutrient availability in relation to chemical and physical properties of soil; fertility evaluation by plant response and soil tests. Pre: 304.
- 460 Soil Physics (3) II (2 L, 1 Lb)** **Uehara**
 Physical properties of soils; structure and moisture relationships. Pre: Phys 161 or 171; Soils 304.
- 461 Soil Erosion: Causes and Controls (3) I** **Ekern**
 Physical properties of soil which influence erodibility; energy sources and mechanics of water and wind erosion; principles of vegetative and mechanical controls; survey of development and spread of conservation movement. Pre: consent of instructor.
- 470 Tropical Soil Survey and Interpretation (2) I** **Staff**
 Field study of tropical soils, soil mapping, correlation, classification, interpretation by standard U.S. methods. Field practice in preparation of soil maps and reports. Pre: 304. (Alt. yrs.; not offered 1969-70.)
- 499 Agricultural Thesis (arr.) I, II** **Uehara**

- 640 Advanced Soil Chemistry (3) II (2 L, 1 Lb)** **El-Swaify**
 Physico-chemical properties of soils and soil solution with emphasis on colloidal, surface, ionic equilibrium relationships. Pre: 340; Chem 351 recommended.
- 650 Advanced Soil Fertility (4) I (2 L, 2 Lb)** **Fox**
 Ion exchange, organic matter transformations, and mobility of nutrient and non-nutrient ions related to crop growth and composition. Use of soil and plant analyses for estimating fertilizer requirements. Pre: consent of instructor.
- 661 Meteorology in Agriculture (3) II** **Ekern**
 Elements and mechanics of weather; response of plants to weather elements; manipulation of microclimate; weather requirements of major crops; weather and plant disease and insects; weather and warm-blooded animals, including man. Pre: consent of instructor. (Alt. yrs.; not offered 1969-70.)
- 670 Soil Formation and Classification (4) I** **Ikawa**
 Weathering and alteration of rocks and sediments; formation of soils; comprehensive review of effects of climate, vegetation, drainage, topography and time on formation of soils and sediments; comparative survey of soil classification systems. Emphasis on tropical soils. Pre: consent of instructor.
- 671 Soil and Clay Mineralogy (3) II (2 L, 1 Lb)** **Jones**
 Identification of soil secondary minerals with emphasis on clay. Pre: Geol 301 or consent of instructor.
- 699 Directed Research (arr.) I, II** **Staff**
 Pre: candidacy for M.S. degree; consent of instructor.
- 704 Soil Science Seminar (1) I, II** **Staff**
 Review of recent findings in soil science research in fields of soil chemistry, physics, classification, fertility, bacteriology, technology. Pre: graduate standing.
- 799 Directed Research (arr.) I, II** **Staff**
 Pre: candidacy for Ph.D. degree; consent of instructor.

Animal Sciences (AnSc)

Professors BROOKS, COBB, KOSHI, ROSS, WAYMAN; Associate Professors HERRICK, HUGH, MIYAHARA, STANLEY; Assistant Professor IWANAGA; Lecturer SMITH

- 141 Animals and Man (3) II** **Herrick**
 Study of major farm animals and poultry and their contribution to man, origin of species, distribution and economic importance.
- 241 Feeds and Feeding (3) I (2 L, 1 Lb)** **Stanley**
 Basic principles of feeding farm animals; composition and nutritional value of feeds; nutritional requirements of beef cattle, dairy cattle, horses, poultry, swine; balancing rations for specific productive purposes. Pre: Chem 114, 116.
- 341 Livestock Management Laboratory (3) SS (5 L, Lb for 6 weeks)** **Staff**
 Assigned problems and practical experience in management of livestock; evaluating, feeding, housing beef cattle, dairy cattle, poultry, swine. Recommended for Animal Sciences majors during summer between junior and senior years. May be taken by other students with adequate background. Pre: consent of chairman.
- 342 Beef Production (3) II** **Wayman**
 World beef production problems, resources and opportunities; selection of breeding stock, principles of handling and feeding on range and in feedlot. Pre: 141. (Alt. yrs.; not offered 1969-70.)

ANIMAL SCIENCES

- 343 Tropical Dairying (3) II** **Koshi**
Principles involved in economical milk production in the tropics; breeds of dairy cattle, selection, raising young animals; care, housing, management of milking herd; factors affecting quantity and quality of milk produced. Pre: 141. (Alt. yrs.; offered 1969-70.)
- 344 Swine Production (3) I** **Hugh**
Principles of efficient pork production including breeds, breeding, feeding, management, marketing. Pre: 141. (Alt. yrs.; not offered 1969-70.)
- 345 Poultry Production (2) II** **Herrick**
Principles involved in economical production of poultry meat and eggs; breeding, feeding, housing, management of different types of poultry. Problems associated with tropical environment emphasized. Pre: 141, 241 or consent of instructor. (Alt. yrs.; offered 1969-70.)
- 346 Horses and Horsemanship (3) I (2 L, 1 Lb)** **Smith**
Origin of species, breeds, nutrition, care, management. Laboratory on management practices with work on light horses.
- 442-443 Physiology of Domestic Animals (4-4) Yr. (3 L, 1 Lb)** **Wayman**
Organ systems of body, their anatomical arrangement, structure, function. Emphasis on most important species. (Alt. yrs.; offered 1969-70.)
- 444 Animal Nutrition (4) II (3 L, 1 Lb)** **Brooks**
Sources, digestion, metabolism, functions, requirements and inter-relationships of nutrients for maintenance and production of domestic animals. Pre: 241, AgBio 402. (Alt. yrs.; not offered 1969-70.)
- 445 Animal Breeding (3) I** **Cobb**
Application of genetic principles to improvement of livestock, including poultry. Pre: Genet 451 or consent of instructor. (Alt. yrs.; offered 1969-70.)
- 446 Animal Diseases and their Control (3) I (2 L, 1 Lb)** **Miyahara**
Disease problems of livestock and poultry; prevention, control, eradication. Pre: 141, and consent of instructor.
- 499 Directed Study or Research (arr.) I, II** **Staff**
Limited to exceptional undergraduate students, generally with a 2.7 overall grade-point ratio or 3.0 in major. Exceptions may be granted students with high achievement in last 3 semesters. Pre: consent of instructor.
- 641 Seminar in Animal Science (1) I, II** **Staff**
Topics of current interest and current research related to nutrition, genetics, physiology. Pre: consent of instructor.
- 642 Ruminant Nutrition (2) II** **Stanley**
Physiology and nutrition of ruminant, including microbiology of rumen, carbohydrate utilization, production of volatile fatty acids, protein metabolism, absorption of nutrients, metabolic processes, normal and abnormal functions within rumen. Pre: 442-443, 444; AB 402. (Alt. yrs.; not offered 1969-70.)
- 643 Physiology of Reproduction (3) I** **Wayman**
Comparative differentiation, development, growth, function of the reproductive systems of mammals and birds; external factors which influence response; artificial insemination. Pre: 442-443 or equivalent. (Alt. yrs.; offered 1969-70.)
- 645 Quantitative Genetics (3) II (2 L, 1 Lb)** **Cobb**
Concepts relating to genetic properties of populations and to inheritance of quantitative traits. Pre: Genet 451. (Alt. yrs.; not offered 1969-70.)
- 699 Directed Research (arr.) I, II, SS**
(1) Genetics—Cobb; (2) Nutrition—Brooks, Ross, Stanley, Palafox; (3) Physiology—Wayman, Herrick; (4) Pathology—Furumoto; (5) Management—Staff.
- 800 Thesis Research (arr.)** **Staff**

Entomology (Ento)

Senior Professors BESS, HARDY; Professors NAMBA, NISHIDA, M. SHERMAN; Associate Professors BEARDSLEY, HARAMOTO, LAPLANTE, MITCHELL, TAMASHIRO

- 161 **General Entomology (4) I, II (2 L, 2 Lb)** Hardy, Mitchell
Structure, habits, biology, classification of insects; insects characteristic of Hawaii. Pre: Zool 101 or Bot 101.
- 361 **Insect Morphology (3) I (2 L-Lb)** Namba
Comparative and gross morphology; homologies of structures; anatomy; development in representative groups. Pre: 161.
- 362 **Systematic Entomology (3) II (2 L-Lb)** Hardy
Classification of insects; orders and families. Use of taxonomic tools. Pre: 361.
- 372 **Economic Entomology (4) II (3 L, 1 Lb)** Sherman
Insect pests; principles of chemical, biological, cultural control. Laboratories on Hawaiian insects of households, plants, animals. Pre: 161; Chem 113-114.
- 399 **Directed Research (arr.) I, II** Staff
Limited to exceptional undergraduate students qualified to carry on research problems.
- 661 **Medical and Veterinary Entomology (3) I (2 L, 2 Lb)** Hardy
Insects and other arthropods in relation to human and animal diseases. Pre: 161, desirable Zool 340 and Micro 351.
- 662 **Advanced Systematic Entomology (3) II (2 L-Lb)**
Principles of systematics; Nomenclatorial problems; international code. Pre: 362.
- 663 **Scale Insects (3) I (2 L-Lb)** Beardsley
Coccids of Hawaii. Taxonomy, techniques, economic importance, control. Pre: 161; Bot 461 desirable. (Alt. Yrs.; not offered 1969-70.)
- 664 **Immature Insects (3) II (2 L, 2 Lb)** Beardsley
Identification, structure, literature, economic significance, emphasis on Holometabola. Pre: 362.
- 671 **Insect Ecology (3) II (2 L, 1 Lb)** Bess, Nishida
Insects as living units in an environment of physical and biotic factors. Pre: 362, 372; desirable Zool 631, 632. (Alt. yrs.; offered 1969-70.)
- 672 **Acarology (3) II (2 L, 2 Lb)** Haramoto
Taxonomy, biology, ecology of mites. Emphasis on medically and agriculturally important species. Pre: 362. (Alt yrs.: offered 1969-70.)
- 673 **Insect Pathology (3) I (2 L, 1 Lb)** Tamashiro
Diseases of insects; histopathology; microbial agents and biological control. Pre: 372.
- 675 **Biological Control of Pests (3) I (2 L, 1 Lb)** Bess, Nishida
Fundamental concepts. Critical study of major biological control projects. Pre: 362 and 372; desirable Zool 631, 632. (Alt. yrs.; not offered 1969-70.)
- 680 **Insect Toxicology (4) I (3 L, 1 Lb)** Sherman
Mode of action and metabolism of insecticides by insects, plants, and the higher animals. Pre: 372; Chem 243, 244, 245, 246. (Alt. yrs; offered 1969-70.)
- 686 **Insect Transmission of Plant Pathogens (3) II (2 L-Lb)** Namba
Problems of insect transmission of plant pathogens. Pre: 161 and PPath 410. (Alt. yrs., offered 1969-70.)
- 697 **Entomology Seminar (1) I, II** Staff
Current entomological literature. Reviews and reports. Required of graduate students in entomology.

- 699 Directed Research (arr.) I, II** **Staff**
Directed research and critical reviews in various fields of entomology.
- 800 Thesis Research (arr.)** **Staff**

Food Science and Technology (FdSc)

Professor Ross; Associate Professors FRANK, YAMAMOTO; Assistant Professor MOY

- 301 Food Technology (2) I** **Ross**
Introduction to field of food technology and survey of commercial food processing. Special tropical and Asian food products. Lectures and field trips to local processors. (Alt. yrs.; offered 1969-70.)
- 601 Principles in Food Science and Technology (3) II** **Ross**
Integration of physical, chemical, biological concepts to formulate basic principles in food science and technology; scientific basis of food preservation. Pre: general physics, biochemistry, microbiology. (Alt. yrs.; offered 1969-70.)
- 603 Microbiology of Foods (3) I** **Frank**
Description of micro-organisms encountered in foods; different types of food spoilage; various methods used for food preservation. Pre: Micro 351 and consent of instructor. (Alt. yrs.; offered 1969-70.)
- 604 Laboratory Methods for Food Microbiology (2) I (2 Lb)** **Frank**
Laboratory methods for studying food spoilage, its control and prevention. Pre: Micro 351 and consent of instructor. (Alt. yrs.; not offered 1969-70.)
- 610 Principles of Tropical Food Processing and Preservation (3) 1 (2 L, 1 3-Hr Lb)** **Moy**
Engineering principles of processing and preservation; unit operations in dehydration, freezing, freeze-drying, irradiation, thermal processing, chemical preservation of tropical foods; review of fluid mechanics, heat transfer, psychrometry. Pre: 1 year each of general physics, general chemistry, algebra.
- 611 Chemistry and Technology of Tropical Food Products (3) II (2 L, 1 3-Hr Lb)** **Moy**
Physical chemistry of food texture, color, flavor; instrumentation and chemical analysis of tropical food products; experimental test methods and quality control in new product development. Pre: consent of instructor.
- 620 Seminar in Food Science (1) I** **Frank**
Special topics, reports, informal discussion of graduate student research. Pre: consent of instructor.
- 640 Food Safety (2) II** **Yamamoto**
Discussion of potential hazards in foods, e.g., natural, bacterial, and fungal toxics, pesticide residues, food additives, and food irradiation. Practical means for reducing or eliminating health hazards will also be considered. Pre: consent of instructor.
- 699 Directed Research (arr.) I, II** **Staff**
Pre: consent of department chairman.
- 701 Seminar in Recent Advances in Food Research (1) II** **Frank**
Reports and discussions from current literature in food science and technology.
- 730 Biochemical Aspects of Food Science (3) II** **Yamamoto**
Properties of natural compounds of importance to food processing including application and control for selected enzyme systems. Pre: biochemistry, consent of instructor.

- 799 Directed Research (arr.) I, II
Pre: consent of adviser.
- 800 Thesis Research (arr.) I, II

Staff

Staff

Horticulture (Hort)

Professors BREWBAKER, GILBERT, HAMILTON, KAMEMOTO, SAGAWA, WARNER, WATSON; Associate Professors NAKASONE, ROMANOWSKI; Assistant Professors CRILEY, HARTMANN, McLAIN

- 101 Plants are for People (2) I (2 L) Watson
Impact of Hawaiian flowers, fruits, trees, shrubs, vegetables to life in tropics and subtropics. (Not open to agricultural majors.)
- 262 Principles of Horticulture (4) I, II (3 L, 1 Lb) McLain, Romanowski
Relationships of plant structures, nutrients, environment, cultural methods to plant growth. Pre: Bot 101; credit or concurrent registration in Chem 114.
- 350 Tropical Landscape Horticulture (3) II (2 L, 1 Lb) McLain
Concepts and techniques of landscape plant production, distribution, and utilization in the tropics. Pre: 262.
- 450 Tropical Horticultural Crop Production (4) I (3 L, 1 Lb) Nakasone, Staff
Factors affecting the production of important horticultural crops in Hawaii. Pre: 262.
- 453 Principles of Plant Breeding (3) II (2 L, 1 Lb) Hartmann, Staff
Application of genetics to crop improvement, breeding methods, breeding of plants in Hawaii. Pre: Genet 451.
- 471 Post-Harvest Handling (3) II (2 L, 1 Lb) Akamine
Handling and storage of horticultural crops. Pre: 262 or consent of instructor. (Alt. yrs.; offered 1969-70.)
- 481 Weed Science (3) I (2 L, 1 Lb) Romanowski
Weed classification and principles of control. Pre: 262 or Agron 201. (Alt. yrs.; not offered 1969-70.)
- 603 Experimental Design (3) I (2 L, 1 Lb) Brewbaker
Design of experiments and variance analyses in biological and agricultural research. Pre: Zool 631 or Ag Econ 434 or equivalent. Desirable: Zool 632.
- 611 Crop Improvement Systems and the Plant Breeding Profession (3) I (2 L, 1 Lb) Gilbert
Recent problems, methods, and organizations involved in the genetic improvement of crop varieties or cultivars. Breeding for disease resistance and other special effects. Pre: 453. (Alt. yrs.; offered 1969-70.)
- 615 Advanced Plant Breeding (3) I (3 L) Hartmann
Principles of population and quantitative genetics as applied to increased yield in crop plants. Pre: 453. (Alt. yrs.; not offered 1969-70.)
- 618 Cytogenetics (3) II (2 L, 1 Lb) Sagawa
Correlation of genetic and cytological phenomena. Pre: Genet 451, Bot 618. (Alt. yrs.; offered 1969-70.)
- 650 Advanced Vegetable Crops (3) I (2 L, 1 Lb) Gilbert, Romanowski
Recent developments in vegetable technology, crop physiology, cultural methods and vegetable systematics. Pre: 262. (Alt. yrs.; not offered 1969-70.)
- 662 Advanced Tropical Fruit Science (3) (2 L, 1 Lb) Hamilton
Origin, taxonomic relationships, genetics, breeding, technical aspects of culture of fruit and nut crops commercially important in Hawaii. Pre: 450. (Alt. yrs.; offered 1969-70.)

PLANT PATHOLOGY

- 664 Orchidology (3) II (2 L, 1 Lb)** **Kamemoto**
Classification, culture, cytogenetics, breeding of orchids. Pre: Bot 101; Genet 451. (Alt. yrs.; not offered 1969-70.)
- 666 Radiation Biology (3) II (2 L, 1 Lb)** **Brewbaker**
Types and sources of radiation; effects of irradiation on living organisms; applications in agricultural research. Pre: consent of instructor. (Alt. yrs.; not offered 1969-70.)
- 667 Horticulture Seminar (1) I, II** **Staff**
Presentation of research reports; reviews of current literature in horticulture.
- 668 Growth Regulators in Horticulture (2) II (2 L)** **Criley**
Concepts of plant growth regulation and application in agriculture. Pre: Bot 470.
- 669 Laboratory in Plant Growth Regulators (1) II (1 Lb)** **Criley**
Extraction, isolation, identification, and bioassay of endogenous plant growth substances; screening and field testing of chemical substances for growth regulator activity. Pre: Bot 470 and/or consent of instructor.
- 691 Crop Ecology (3) I (2 L, 1 Lb)** **Warner**
Climatic, edaphic, and biotic factors influencing tropical and subtropical crops; instrumentation and data interpretation. Pre: 262 or consent of instructor. (Alt. yrs.; offered 1969-70.)
- 699 Directed Research (arr.) I, II** **Staff**
Pre: consent of instructor.
- 711 Special Topics in Experimental Horticulture (arr.) I, II** **Staff**
Discussion of recent advances in horticultural research with detailed study of specific areas in this field. Pre: consent of instructor.
- 800 Thesis Research (arr.) I, II** **Staff**

Plant Pathology (PPath)

Professors BUDDENHAGEN, McCAIN; Associate Professors ARAGAKI, HOLTZMANN, ISHII, MARTINEZ, MEREDITH, PATIL, TRUJILLO; Assistant Professors HUNTER, KO

- 410 Principles of Plant Pathology (4) I (2 L, 2 Lb)** **Holtzmann**
Disease in plants, emphasis upon infection and development in relation to environment; epidemiology; methods of appraisal; control. Pre: Bot 101.
- 601 Tropical Plant Pathology (3) I (2 L, 1 Lb)** **Meredith**
Diseases of tropical crops and their control, emphasis on phytopathological principles peculiar to plant diseases in the tropics. Includes fungi, bacteria; viruses, mycoplasma, and nematodes. (Alt. yrs.; offered 1969-70.)
- 605 Clinical Plant Pathology (2) SS (2 Lb)** **Staff**
Recognition and familiarization with broad spectrum of tropical plant diseases. Evaluation of disease problems in the field; diagnosis and identification of plant pathogens in the laboratory. Pre: 410 and consent of instructor.
- 610 Principles of Plant Disease Control (3) II (2 L, 1 Lb)** **Aragaki**
Methodology and application of plant disease control. Pre: 410. (Alt. yrs.; offered 1969-70.)
- 615 Plant Nematology (3) II (2 L-Lb)** **Holtzmann**
Collection, classification, morphology, biology, control of nematodes which attack economic crops. Pre: 410; Zool 101, or consent of instructor. (Alt. yrs.; not offered 1969-70.)

- 620 Plant Pathology Techniques (3) I (2 L-Lb)** **Staff**
 Laboratory and greenhouse methods for study of plant diseases; isolation, culture, inoculation; pathological histology and physiology, photography. Pre: 410, Micro 351; or consent of instructor.
- 625 Advanced Plant Pathology (2) II** **Buddenhagen**
 Analysis of basic concepts of plant diseases; emphasis on evolution and physiology of parasitism, etiology, epidemiological principles. Pre: 410, 610; or consent of instructor. (Alt. yrs.; not offered 1969-70.)
- 630 Plant Virology (3) II (2 L, 1 Lb)** **Ishii**
 Plant viruses: diseases caused in economic plants, biological and physical properties. Pre: 410, or consent of instructor.
- 635 Epidemiology of Plant Diseases (3) I (3 L)** **Meredith**
 Epidemics of disease in plant communities; analysis of origin and development of epidemics, and how they are affected by biological and physiological factors. Pre: 410. (Alt. yrs.; not offered 1969-70.)
- 660 Seminar (1) I, II** **Staff**
 Seminars in contemporary research. Reviews and reports.
- 699 Directed Research (arr.) I, II** **Staff**
 Pre: candidacy for M.S. degree; consent of instructor.
- 705 Host-Parasite Physiology (3) II (2 L, 1 Lb)** **Patil**
 Physiology of disease and interaction between host and pathogen; resistance mechanisms. (Alt. yrs.; offered 1969-70.)
- 800 Thesis Research (arr.)** **Staff**

Plant Physiology

Professors AKAMINE, CLEMENTS, COOIL, KEFFORD, SIEGEL; Associate Professors FRIEND, NAKATA, PUTMAN

For course descriptions, see the following listings under the department of botany.

BOTANY

- 440 Environmental and Space Biology I (2) I (2 L)**
470 Principles of Plant Physiology (4) II (3 L, 1 Lb)
612 Advanced Botanical Problems (arr.) I, II
640 Environmental and Space Biology II (2) I (1 L, 1 Lb) Alt. Yrs.
670 Plant Nutrition and Water Relations (3) I (3 L)
671 Energetics and Biosynthesis in the Plant Kingdom (3) II (3 L)
672 Techniques in Physiology (2) I (2 Lb)
673 Techniques in Physiology-Biochemistry (2) II (2 Lb)
675 Physiology Seminar (1) I, II
699 Directed Research (arr.) I, II

CURRICULA IN HUMAN RESOURCES DEVELOPMENT

The Human Resources Development programs are designed to provide, through the facilities of the departments and the University, a liberal education integrating the social and natural sciences, the humanities and the arts, and to provide specialized instruction based upon these disciplines as preparation for professional careers in which the interest and well-being of the individual, the family, and the community are paramount.

As the functions of the family are being shifted increasingly to the larger community, there are expanded opportunities for related careers for men and women in educational and social agencies, government, business and industry, research laboratories, public and private institutions and services.

In addition, the departments offer interdisciplinary courses designed to serve other professional schools and as electives for members of the general student body who wish to relate knowledge to social use.

The four departments within this division are:

Fashion Design, Textiles & Merchandising
Food and Nutritional Sciences
Home Economics
Human Development

Admission and Degree Requirements

Admission requirements are the same as those for the University. To be entitled to a bachelor's degree a student must:

1. Complete the University's general education requirements;
2. complete, in addition to the general education requirements, 60 hours or more of non-introductory courses;
3. offer the prescribed requirement for one of the curricula in Human Resources Development (may overlap 1 and 2);
4. earn at least a 2.0 grade-point ratio (C average) for all registered credits.

Fashion Design, Textiles and Merchandising

The curricula in fashion design and fashion merchandising leads to careers in business and industry.

The Fashion Design option offers qualified students the opportunity to prepare for positions as designers, assistant designers, stylists, or fashion executives. Starting positions are sample makers, graders, and pattern makers.

The Fashion Merchandising option offers qualified students the opportunity to prepare for fashion careers with retail and wholesale

organizations in buying, merchandising, fashion coordination, publicity, sales or marketing.

Within the established curricula of both options there is an opportunity to participate in field experience in business and industry.

There is also a possibility of a year in New York at the Fashion Institute of Technology to be taken during the junior year.

FASHION DESIGN (FDM)

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
Eng 100	3	*Literature	3
Psy 100	3	*Natural Science	3 or 4
Art 101	3	Art (Studio A, B, C or D)	3
FDM 125 or 113	3	FDM 113 or 125	3
FDM 111	3	Speech 145	3
		HPE	1
Total	15	Total	16

SECOND YEAR

Art (Studio A, B, C or D)	3	*Quantitative Reasoning	3
Hist 151	3	*Humanities	3
Econ 120	3	Hist 152	3
FDM 213 or 215	3	FDM 215 or 213	3
FDM 216	3	Art (Studio A, B, C or D)	3
Total	15	Total	15

THIRD YEAR

*Natural Science	3 or 4	*Natural Science	3 or 4
FDM 315	3	FDM 316	3
FDM 417	3	FDM 416 or 418	3
Art 230	3	HRD elective	3
*Social Science elective	3	FDM 324—optional	1
FDM 415	1	Elective	3 or 4
Total	16	Total	16

S.S.—FDM 329, Field Experience, 2 cr. (optional)

FOURTH YEAR

FDM 419	4	FDM 420	4
HE 357	3	HRD elective	3
Art elective	3	Eng 309 or 315	3
Elective	6	Elective	6
Total	16	Total	16

*See University requirements for bachelor's degrees.
60 credits in non-introductory courses required for graduation.
125 credits required for graduation.

FASHION MERCHANDISING (FDM)

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
Eng 100	3	*Literature	3
Psy 100	3	*Quantitative Reasoning	3
Art 101	3	Art (Studio A, B, C or D)	3
FDM 125 or 113	3	FDM 125 or 113	3
Sp 145	3	FDM 111	3
	<hr/>	HPE	1
Total	15	Total	16

SECOND YEAR

	CREDITS		CREDITS
*Natural Science	3 or 4	*Natural Science	3 or 4
Hist 151	3	Art (Studio A, B, C or D)	3
FDM 216	3	Hist 152	3
FDM 213	3	Econ 120	3
Acct 201	3	Acct 202	3
	<hr/>		<hr/>
Total	16	Total	15

THIRD YEAR

	CREDITS		CREDITS
*Natural Science	3 or 4	*Humanities	3
*Social Sc. elective	3	FDM 328	3
Mkt 300	3	Mkt 315	3
HE 255	3	HE 357	3
FDM 327	3	FDM 324 (Optional)	1
	<hr/>	Eng 309 or 315	3
Total	16	Total	16

S.S.—FDM 329, Field Experience, 2 cr. (Optional)

FOURTH YEAR

	CREDITS		CREDITS
Mkt 341	3	HRD elective	3
HRD elective	3	FDM 416 or 418	3
FDM 417	3	FDM 425	3
Electives	6 or 7	Elective	7
	<hr/>		<hr/>
Total	15 or 16	Total	16

*See University requirements for bachelor's degrees.

60 credits in non-introductory courses required for graduation.

125 credits required for graduation.

Fashion Design, Textiles and Merchandising (FDM)

Associate Professors TROXELL, UMBEL; Assistant Professors FURER, HERRICK;
Lecturers AIKMAN, SWANSON

- 111 Esthetics of Clothing (3) I, II (2 L, 1 Lb)** Herrick
Factors involved in clothing selection. Principles of line, color, design for individual figures. Consumer buying of wardrobes. Open to freshmen and sophomore women.
- 113 Basic Clothing Construction (3) I, II (1 L, 2 Lb)** Staff
Selection and use of equipment and commercial patterns. Basic principles of construction and fitting.
- 125 Fashion Analysis (3) I, II (2 L, 1 Lb)** Troxell
Dynamics of fashion; environmental factors influencing fashion demand; analysis of trends. History, structure and terminology of the fashion industry.
- 213 Textiles (3) I, II (2 L, 1 Lb)** Herrick
Fibers, yarns, fabric construction, finishes related to selection, use, care of textiles.
- 215 Block Pattern Designing (3) I, II (3 L)** Umbel
Principles of pattern making for women's apparel through manipulation of quarter size pattern blocks. Pre: 113.
- 216 Fashion Design & Sketching (3) I, II (3 L)** Furer
Development of apparel design through sketching the fashion figure. Pre: 111.
- 301 Man and Clothing (3) I (2 L, 1 Lb)** Staff
Sociological, psychological and economic implications of clothing and textiles for the individual and society, as seen in historic and contemporary perspective. Pre: Soc 151.
- 315 Draping (3) I (3-2 Hr L-Lb)** Umbel
Principles of pattern making through draping muslin models to standard measurements. Pre: 215.
- 316 Advanced Pattern Designing (3) II (2-3 Hr Lb)** Furer
Fashion designs made by flat pattern method. Muslin proofs constructed and patterns graded to standard measurements. Pre: 315.
- 324 Fashion Careers (1) II (1 L)** Troxell
Preparation for fashion design and merchandising field work and career placement; analysis of personal qualifications, survey of job markets, preparation of resumes, directing of employment interviews, employment decision-making. FDM juniors and seniors only.
- 327 Fashion Merchandising (3) I (3 L)** Troxell
Major considerations involved in buying and selling fashion merchandise. Organization for merchandising, sources of buying information, merchandising policies, resident buying officers, centralized buying and merchandising. Pre: 125, or concurrent Mkt. 300.
- 328 Fashion Merchandise Planning & Control (3) II (3 L)** Troxell
Theories and procedures involved in financial and assortment planning and control of fashion inventories. Pre: 327, Acct 201-202.
- 329 Field Experience (2) S.S.** Troxell, Furer
Eight weeks' full time supervised internship in the fashion industry; comprehensive terminal report required. Pre: 324; 316 or 328; 2.5 GPR and consent of instructor.
- 415 Creative Clothing Construction (1 or 3) I, II (2L or 2-3 Hr L-Lb)** Umbel
Clothing construction as creative expression. Construction techniques that contribute to individuality in dress. Pre: 113.

FOOD AND NUTRITIONAL SCIENCES

416 Costumes of Northeast Asia (3) II (3 L)

Umbel

Historical development and characteristic features of traditional and folk costumes and fabrics of China, Vietnam, Korea, Japan, Okinawa. Relation to customs and culture; impact of Western influence on contemporary dress. Pre: Hist 151-152. (FDM 216-F.D. Majors only) (Alt. yrs.)

417 Costumes of the Western World (3) I (3 L)

Furer

Chronological study of costume as related to culture and customs in its historical and contemporary contexts. Pre: Hist 151-152 (FDM 216-F.D. majors only)

418 Costumes of South and Southeast Asia (3) II (3 L)

Umbel

Historical development and characteristic features of traditional and folk costumes and fabrics of India, Pakistan, Thailand, Cambodia, Malaysia, Indonesia, the Philippines. Relation to customs and culture; impact of Western influence on contemporary dress. Pre: Hist 151-152 (FDM 216-F.D. majors only) (Alt. yrs.; not offered 1969-70.)

419-420 Apparel Design Studio (4-4) Yr. (2-4 Hr L-Lb)

Furer

Designing, executing patterns, muslin proofs, completion and showing of ready-to-wear collection by Fashion Design seniors. Development of fashion design portfolio. Pre: 316, 417, 416 or 418.

425 Fashion Sales Promotion (3) II (3 L)

Troxell

Principles and procedures in promoting the sale of fashion merchandise. Comprehensive analysis of fashion advertisements, displays, publicity and other sales presentations of retail and manufacturing firms. Pre: 125, 327.

499 Directed Reading & Research (arr.) I, II

Staff

699 Directed Reading & Research (arr.) I, II

Staff

Food and Nutritional Sciences

The curriculum in Food and Nutritional Sciences is designed to prepare men and women for new and expanding opportunities arising from national and international concern for human nutritional welfare. The diversified programs (options) offered are briefly described. All meet the University core requirements:

1. *Nutrition Research option*: This option combines study in a large number of related natural science courses in preparation for positions in research or graduate study.

2. *Community Nutrition option*: This option, together with the natural and social science courses, helps the student to develop skills in communication. It prepares the graduate to interpret nutrition principles for guidance and informal instruction. This program meets the minimum academic requirements for American Dietetic Association (ADA) membership. A limited number of internships are available. The student may wish to do graduate study upon completion of this program.

3. *Therapeutic Dietetics option*: This option meets the minimum academic requirements of the ADA for a therapeutic dietetics internship. The student will be trained to design special diets for patients with various disease conditions.

4. *Foods in Industry and Research option:* This option is designed for training technicians and scientists in areas of foods research, product development, evaluation, quality control, etc. The student may wish to go on to graduate work.

5. *Consumer Services in Foods option:* This option prepares the student for positions in commercial foods, consumer relations, product promotion, and publicity. Persons with knowledge of many aspects of the food industry, combined with talent for communicating by various media, are sought by magazines, newspapers, radio-TV, other food related businesses, and government agencies.

6. *Food Service Management option:* This option meets the minimum academic requirements of the ADA for administrative internships. The students are trained for administrative positions in restaurants, industry dining rooms, university or hospital food services, etc.

All students majoring in Food and Nutritional Sciences will take the core courses and courses in one of the options. Electives will be selected to accumulate a minimum total of 130 credits for graduation.

Core Courses for all Food and Nutrition Majors: Chem 113, 114, 115, 116, 241, 242; Eng 100; Math 134; Hist 151, 152; Sp 145; FN 285; Micro 130, 140; HPE; Biol 220; Humanities (3 semester courses distributed among 2 or more of the 3 groups. Some courses in the Options also satisfy this requirement.); Social Sciences (3 semester courses, including at least one semester course from each of 2 groups. Some courses in the Options also satisfy this requirement.); Psy 100.

(a) *Nutrition Research option:* Math 205, 206; Phys 170, 171, 272, 273; Ag Bio 402, 402L; Soc Sc 301, 302; FN 476, 485, 486, 490, 499; Biol 250; Chem 133, 134, 351; Ag Ec 434; IS 132; Physl 301. Suggested electives: Eng 310, MT 458, FN 477, and GE 251.

(b) *Community Nutrition option:* Econ 120; Rel 150; Psy 113 or Ag Ec 434; Anth 200; FN 275 (or FSA 181), 476, 477, 485, 486, 490, 499; Ag Bio 402, 402L; IS 132; FSA 281; Ed EP 311; Ed CI 312; HD 343, 345; HE 357; Physl 301; Chem 133, 134. The student must select one of the following courses as an elective: HD 332, 341, 342, 430, or 441. Suggested electives: Ed EC 314, Sp 203 (Pre: Sp 101), 362, Psy 320, Journ 325. This program meets the minimum academic requirements for ADA membership.

(c) *Therapeutic Dietetics option:* Art 101; Econ 120; FN 275, 376, 476, 485, 486, 490; Acc 201, 202; Zool 202; FSA 281, 383, 384, 482, 483; HD 345; Mgt 300; Ed Psy 311; Physl 301; PIR 300; Ag Bio 402, 402L or Biochem 441, 442. This option meets the minimum academic requirements of the ADA for therapeutic dietetics internships.

FOOD AND NUTRITIONAL SCIENCES

(d) *Foods in Industry and Research option*: Art 101; Math 205, 206; Chem 133, 134; FN 275 (or FSA 181), 376, 476, 477, 492, 499; IS 132; Anth 200; Econ 120; Phys 170, 171, 272, 273; Ag Ec 434; Fd Sc 301; HE 357; Mkt. 300; FSA 281; Chem 351. Suggested electives: Soc 201; Eng 310; Mkt 315, 331; 341, 381; Chem 352; GE 251.

(e) *Consumer Services in Foods option*: Art 101, 107; Chem 133, 134; FN 275 (or FSA 181), 375 (or FSA 281), 376, 476, 477, 492, 499; Econ 120; Anth 200; Phys 100, 101; IS 132; Soc 151; Ag Ec 434 or Psy 113; Fd Sc 301; Sp 362; HE 357; Mkt 300, one of the following: Mkt 315, 331, 341 or 381; Rel 150; Journ 111, 325. Suggested electives: Art 265-266, Ed EC 314.

(f) *Food Service Management option*: Art 101; FSA 181, 281, 283, 381, 383, 384, 482, 483; Acc 201, 202, 301; Econ 150; Mgt 300, 341; FN 376, 476; Bus Stat 301; PIR 300; Physl 301; Bus Law 300; Bus. Finance 300. This program meets the minimum academic requirements of the ADA for administrative internships.

Food and Nutritional Sciences (FN)

Professors BEATON, LICHTON; Visiting Professors KONISHI, KOTSCHIEVAR; Associate Professors DODERENZ, HILKER, YOUNG; Assistant Professors CHING, CINNAMON, HOTCHKIN, MARETZKI, STANDAL, WEDDLE, WENKAM; Instructor WAGGOTT

275 Principles of Food Preparation (3) I, II (2 L, 2 Lb) Weddle
Scientific principles underlying preparation of foods to yield products of standard quality.

285 Introduction to Human Nutrition (3) I, II (3 L, 1 Lb) Maretzki
Study of nutrition as a socio-biological science. Basic principles of normal nutrition with emphasis upon the application of these principles.

375 Meal Management (4) I (2 L, 2 Lb) Weddle
Planning and preparation of a nutritionally-balanced diet using a variety of food patterns. Consideration of time, energy, money, esthetics and etiquette. Advanced registration required. Pre: 275.

376 Advanced Foods (3) II (2 L, 2 Lb) Weddle
Comparative food studies with emphasis on physical and chemical variables. Pre: 275, Chem 113-114.

385 Principles of Human Nutrition in Health and Disease (3) I, II (3 L) Maretzki
Basic physiological and metabolic aspects of nutrition. The application of nutritional principles in the selection of normal and therapeutic diets. Designed for students in the allied health professions. Pre: Chem 113-114, Biol 220, Physl 301.

476 Cultural Aspects of Food (3) II (3 L) Wenkam
Cultural, socio-psychological influences on food habits. Problems in changing food habits examined in terms of social and behavioral sciences.

477 Food Composition (3) I (1 L, 2 Lb) Wenkam
Proximate analyses of foods and their interpretation. Pre: Math 134 and Chem 133, 134, or equivalent; consent of instructor.

FOOD AND NUTRITIONAL SCIENCES

- 485-486 Advanced Human Nutrition (3-3) I, II (3 L)** **Beaton**
 Biochemistry and physiology of nutrition; fundamental concepts of human nutrition. Pre: Ag Bio 402 or Bioch 441; FN 285 or 385; or equivalents.
- 490 Diet and Disease (3) II (2 L, 1 Lb)** **Cinnamon**
 Modifications of normal diet for use in therapeutic conditions. Physiological bases for modifications. Field trips. Pre: 285 or 385; Ag Bio 402 or Bioch 441.
- 492 Product Evaluation (3) I (2 L, 1 Lb)** **Maretzki**
 Product evaluation as a tool in the development of food products from concept to consumer. Psycho-physical scaling, laboratory difference tests, descriptive analysis of food attributes of odor, flavor, color, and texture, correlation of subjective and objective test methods, consumer testing, and market research techniques. Pre: Basic psychology, statistics; consent of instructor.
- 499 Directed Reading and Research (arr.) I, II** **Staff**

GRADUATE COURSES IN NUTRITION (Nutr)

- 676 Nutritional and Metabolic Diseases (2) II (2 L)** **Lichton**
 Survey of disease mechanisms in undernutrition, overnutrition, malabsorption, fluid imbalances; selected examples of disorders, or inborn errors of metabolism. Pre: 485-486 or consent of instructor.
- 677 Nutrition in Reproduction, Growth and Development (3) I (3 L)** **Standal**
 Nutritional requirements as altered by physiological stresses of pregnancy and periods of growth; emphasis on mechanisms. Pre: 485-486 or equivalent.
- 678 Nutrition in Aging (2) II (2 L)** **Hilker**
 Special nutritional considerations respecting geriatric population; nutrition and longevity. Pre: 485-486 or equivalent.
- 680 Research Methods in Nutrition (3) II** **Young**
 Lecture-laboratory demonstrating principles and applications of instrumentation and animal-handling techniques in nutrition research. Pre: consent of instructor.
- 681 Seminar (1) I** **Doberenz**
 Student presentations of literature reviews and research. Pre: consent of instructor. May be repeated.
- 682 Nutrition Status (3) II (3 L)** **Standal**
 Nutrition survey techniques including biochemical assessment of nutritional status in man. Pre: 485-486 or consent of instructor.
- 684 Lipids in Health and Disease (2) I (2 L)** **Young**
 Lipid metabolism and nutrition with particular emphasis on cardiovascular diseases. Pre: 485-486 or consent of instructor.
- 685-686 Advanced Human Nutrition (1-1) I, II (Yr.)** **Lichton**
 Biochemistry and physiology of nutrition in relation to metabolism and function; fundamental concepts and applications of nutrition. Lecture-conference for graduate students registered concurrently in 485-486.
- 699 Directed Reading and Research (arr.) I, II** **Staff**
- 800 Thesis (arr.) I, II** **Staff**

Food Service Administration (FSA)

181 Basic Principles of Quantity Food Service Management
(3) I, II (1 L, 2 Lb)

Ching

Introduction to fundamentals of basic food preparation, stressing interrelationship of physical, biological, chemical changes in food caused by heat application.

281 Quantity Food Production (3) I, II

Hotchkin

Principles of menu planning, production control, work methods analysis, employee training, preparation techniques, elementary food cost controls, quality analysis of food processed in quantity. Pre: 181.

283 Classical Food and Beverage Management (3) I, II

Hotchkin

Study of classical beverages; production characteristics in relation to food service planning and classical cuisine. Lab experience with gourmet and ethnic cookery. Pre: 281.

381 Food Cost Accounting (2) I

Staff

Accounting principles applied to food service operations, systems and controls, with emphasis on interpretation of financial statements. Budgeting and control of food, beverage and labor costs. Pre: Acc 201-202.

383 Selection and Procurement of Food and Supplies (3) I, II

Staff

Principles of procurement; its relationship to purchasing ethics, policies, specifications. Quality standards for equipment and supplies. Field experience required. Pre: 281.

384 Food Facilities System Planning (3) II

Hotchkin

Analysis of work methods using time and motion study. Layout, design, procurement of furnishings for dining and kitchen facilities and auxiliary space. Pre: 383.

482 Seminar in Food Service Operation Problems (3) II

Staff

Scientific methods of problem-solving and decision-making in analysis of case problems in public food service organizations. Senior standing in major field or consent of instructor.

483 Field Experience in Institutional Management (0-3) I, II

Staff

Organized on-the-job learning experience in institutional food service supervised by employer and coordinating instructor.

484 Food Merchandising (3) I, II (2 L, 1 Lb)

Waggott

Principles of menu planning, interior lighting effects and atmosphere as it relates to food. Plate arrangement and size, garnishment, basic photographic principles, art skills as they relate to color combinations. Floral arranging, draping, etc., and basic printing information for menu layout. Pre: 281, or FN 375, or 376.

499 Directed Reading and Research (arr.) I, II

Staff

699 Directed Reading and Research (arr.) I, II

Staff

Home Economics

Students who select an option in this department may choose one of several educational approaches in which a knowledge of family life in our society and a general home economics background prepares them for teaching persons of various age levels in different organizations and agencies.

Option I. Preparation to meet certification requirements for teaching home economics in the secondary school. This option requires transfer to the College of Education beginning with the junior year with a GPA of 2.5.

Option II. Preparation for home economics positions with the Cooperative Extension Service.

Option III. Preparation for positions in consumer services relating to housing, equipment, foods and clothing and textiles.

Option IV. Preparation for positions in community service organizations.

Requirements for options II, III & IV are worked out for each student in consultation with an advisor after careful exploration of the student's aptitudes, interests and professional goals.

OPTION I

HOME ECONOMICS EDUCATION: SECONDARY SCHOOL TEACHING

FIRST YEAR

FIRST SEMESTER		SECOND SEMESTER	
	CREDITS		CREDITS
*Math 100	3	*Art 101	3
*Chem 113	3	*Chem 114	3
*Chem 115	1	*Chem 116	1
*Eng 100	3	*Econ 150	3
*Sp 145	3	*Psy 100 or 111	3
FDM 113 or FN 275	3	FDM 113 or FN 275	3
	<hr/>		<hr/>
Total	16	Total	16

SECOND YEAR

*Zool 202	4	Phys 100	3
*Eng 251 or 253 or 255	3	Phys 101	1
*Hist 151 or 161 or 351	3	FDM 213	3
*Anthro 150 or 200	3	*Eng 252 or 254 or 256	3
HD 231	3	*Hist 152 or 162 or 352	3
	<hr/>	*Soc 151 or 201	3
Total	16		<hr/>
		Total	16

THIRD YEAR

	CREDITS		CREDITS
HE 255	3	HD 441	3
FN 375	4	HE 253	3
*Micro 130	3	HE 251	3
*Micro 140	1	Ed CI 312	3
Ed EF 310	3	HE 357	3
ED EP 311	3	Ed CI 371	3
Elective	1		<hr/>
	<hr/>	Total	18
Total	18		

FOURTH YEAR

	CREDITS		CREDITS
HE 359	3	Ed CI 390	12
HD 341	3		<hr/>
Ed CI 471	2	Total	12
FN 385	3		
Elective (FDM)	3		
Elective	4		
	<hr/>		
Total	18		
*UH Core			

Home Economics (HE)

Lecturers CRAMER, MASUMOTO

- 251 Household Equipment (3) I, II** Masumoto
Selection, optimum use, upkeep of household equipment. Emphasis on design, construction, materials, consumer use.
- 253 Management of Family Resources (3) I, II** Cramer
Identification of resources; application of management to resources to reach family goals; role of decision-making in management.
- 255 Family Housing and Home Furnishings (3) I, II** Cramer
Evaluation of housing for family living. Selection, use, arrangement of furnishings and accessories in the home. Pre: Art 101.
- 357 Family Economics (3) I, II** Staff
Role of family as consumer unit in the economy. Pre: Econ 150.
- 359 Home Management Lab (3) I, II** Staff
Readings, group discussions and home projects involving management concepts and decision-making. Pre: senior standing; 253.
- 461 Management of Personal and Family Finances (3) I** Staff
Application of management principles to major financial alternatives. Role of decision-making in financial management. Relationship of financial decisions to life cycle of individual and family.
- 475 Field Experience in Home Economics (3) I, II** Staff
Field experience carried out in connection with Cooperative Extension Service and other community projects dealing with family living. Readings, conferences, reports required. Pre: consent of instructor.
- 499 Directed Reading and Research (arr.) I, II** Staff
- 699 Directed Reading and Research (arr.) I, II** Staff

Human Development (HD)

Human development is the study of human behavior over the life span in existing life situations. The focus is upon three interrelated types of phenomena; the physical and psychological changes of the human organism, the interpersonal roles and relationships within the family and the operation of the family within the larger social structure. The processes and consequences of the interaction among these components make up the major foci of the field. Students may satisfy degree requirements in human development with emphasis on either Child Development or Family and Community Service. The child development option orients the students toward work with preschool children and their parents in group centers. Family and community service orients the students toward adult education, college student personnel, business, and work in various types of community agencies. Admission to upper division major status requires a minimum grade-point average of 2.0, successful completion of HD 231-232 and HD 341, and interview with the departmental Faculty-Student Council. It is the purpose of the council to in-

sure that applicants fully understand the objectives of the department as well as the nature and scope of required academic and practical work.

Students wishing to be considered for admission should apply through the department chairman. Freshmen may be admitted provisionally to the department and are encouraged to take part in its affairs. Others should apply as early as possible in their sophomore year. Those applying after the beginning of the Fall semester in their junior year may need to attend an additional semester.

Professors CHANTINY, KRAEMER, LAMPARD, WEEKS; Associate Professor ALLEN; Assistant Professors MEREDITH, SCHWITTERS; Instructor BROWN; Lecturer BRANDON

231-232 Introduction to Human Development (3-3) I, II (Yr.) Schwitters

Principles of development from birth to puberty. Emphasis on impact of family interaction; practical and social implications of existing knowledge from behavioral sciences; Observation of situations involving children. Courses are to be taken in sequence. Pre: Psy 100 or 111-112.

332 Cultural Aspects of Child Rearing (3) II Staff

Cultural context of socialization; class and ethnic differentials. Cultural influences on individual and family, on child rearing practices and personality development. Pre: Psy 350 and Anthro 200.

334 Group Work with Children (3) II Schwitters

Principles underlying group work with children. Understanding human growth and interpersonal relationship and maximizing use of environment. Major focus: analysis and program planning. Pre: 231-232; consent of instructor.

341-342 Family Relationships (3-3) I, II (Yr.) Lampard

Study of courtship, marriage, and family relationships in the modern setting. Role confusion and conflict, freedom and authority, and value of the family to the individual will be explored. (341 and consent of instructor are pre-requisite for 342.)

343 Human Needs and Community Resources (3) I, II Brown

Cross-cultural and historical study of organization and implementation of communitywide programs for meeting family needs. Role of individual and family in coordination of home and community resources. Pre: Soc 151 or 201.

345 Group Leadership (3) I, II Allen

Sociological and psychological concepts pertaining to individual motivation and internal and external group forces. Application of group techniques to planning and conducting activities related to human resources development.

430 Work with Parents (3) II Chantiny

Study of parental behavior as function of individual personality and cultural and social context. Interpretation of research in behavioral sciences with view to policy and practices of working with parents. Field experience with parent groups in local community. Pre: senior standing and consent of instructor.

431-432 Preschool Practicum (4-4) I, II (Yr.) Staff

Application of theory and early childhood education to experience in preschool. Students will arrange morning hours 2 days each week for participation in preschool. Pre: 333 and consent of instructor.

441 The Adolescent in the Family and Community (3) I Kraemer

Multidisciplinary study of adolescence as stage of development within family life cycle.

HAWAII AGRICULTURAL EXPERIMENT STATION

442 Community Action (3) II

Allen

Community analysis, mobilization, organization of human and community resources for social action. Focus on improvement of family living. Field studies. Pre: 343, 345.

444 Male-Female Subcultures (2) II

Kraemer

Interdisciplinary approach to study of male and female roles in family and society. Consideration given to cross cultural variation and to impact of social change.

449 Field Experience in Human Development (0-3) I, II

Staff

Application of human development theory emphasizing group participation and leadership development. Students required to obtain work during summer or other suitable time which provides group experience such as developing and implementing program or serving in leadership capacity.

641 Seminar in Human Development, Family Relationships (3) I, II

Chantiny

Review and analysis of literature related to human development and interpersonal relationships within family. Projects carried out according to group interests. May be repeated for credit.

646 Interpersonal Relationships (3) II

Lampard

499 Directed Reading and Research (arr.) I, II

Staff

699 Directed Reading and Research (arr.) I, II

Staff

HAWAII AGRICULTURAL EXPERIMENT STATION

The facilities of the station, including the research staff, the field laboratory, and the Agricultural Engineering Institute, are available in part for undergraduate and graduate instruction. Students are able to study the latest methods and results of agricultural research. Close collaboration is maintained with the stations of the Hawaiian Sugar Planters' Association and the Pineapple Research Institute of Hawaii.

The function of the station is "to promote scientific investigation and experiments respecting the principles and applications of agricultural science" (Hatch Act of 1887). Investigations cover the physiology of plants and animals; diseases, insects, and parasites; agronomy, soils, food science, food processing, agricultural engineering, biochemistry, human and animal nutrition; breeding and genetics; as well as other research in culture, production, and marketing.

Facilities for carrying on this work are provided by the headquarters offices and laboratories located on the University campus; by research farms at Poamoho and Waimanalo, Oahu; and by branch stations on the neighbor islands with attached laboratories and experimental farms.

These include the Kona Branch Station; the East Hawaii Branch Station with farms at Malama-Ki, Kulani, Waiakea, Volcano, and Hamakua and Waimea; the Maui Branch Station with the Haleakala Station; the Kauai Branch Station. Modern research facilities for poultry and animals are available at the Animal Research Center at Waialeale, Oahu.

COOPERATIVE EXTENSION SERVICE IN AGRICULTURE AND HUMAN RESOURCES DEVELOPMENT

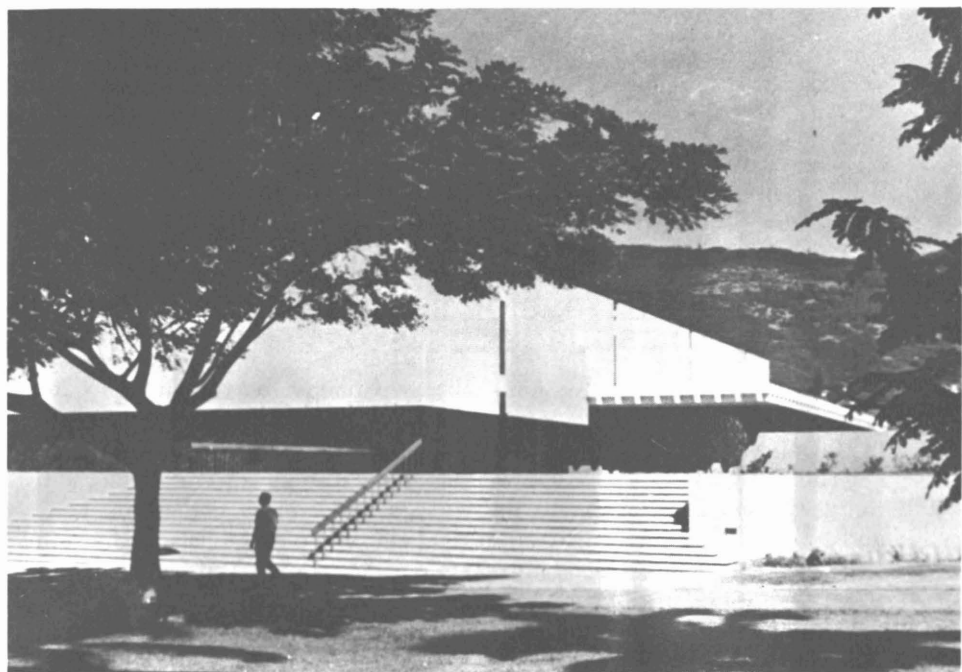
This program, conducted jointly by the College and the United States Department of Agriculture, is devoted to the advancement of agriculture in Hawaii and to the improvement of family living.

The Cooperative Extension Service maintains personal contacts with the rural population through its field staff of county extension agents and county home economists, with the help of the specialists at the state headquarters on the University campus. The county staff operates out of offices located as follows:

Oahu: Honolulu, Kaneohe, Wahiawa, Waianae; Kauai: Lihue; Hawaii: Hilo, Naalehu, Kealahou, Honokaa, Kohala; Maui: Wailuku, Kula; Molokai: Kaunakakai.

Improved farm and home practices are taught by means of practical demonstrations before University extension clubs of men and women, commodity groups, special interest groups, and 4-H clubs of boys and girls. This group instruction is supplemented by farm and home visits and mass media communications. Each year various extension short courses and 4-H events are held on the University campus.

An important phase of extension work is to demonstrate in a practical manner the results of scientific experiments conducted by the Hawaii Agricultural Experiment Station, by state stations, and by the USDA.



Graduate Division

THE GRADUATE DIVISION provides opportunities for further study, research, and professional training to students who have earned a bachelor's degree from an accredited institution of higher learning. The graduate program is not, however, merely an extension of work at the undergraduate level. More rigorous academic standards are applied and a greater degree of independence in the pursuit of knowledge is required. Special emphasis is placed on the cultivation of scholarly attitudes and methods of research.

The University offers graduate work leading to:

- (1) The doctor of philosophy in agricultural economics, anthropology, astronomy, biochemistry, biophysics, botany, chemistry, drama and theatre, educational psychology, electrical engineering, entomology, genetics, geography, geosciences, history, horticulture, linguistics, microbiology, oceanography, pharmacology, philosophy (Western, Asian, and comparative), physics, physiology, political science, psychology, sociology, soil science, and zoology.
- (2) The master's degree in agricultural economics, agricultural engineering, agronomy, American studies, animal sciences, anthropology, architecture, art, Asian languages (Japanese, Chinese), Asian studies, astronomy, biochemistry, biophysics, botany, business administration, chemistry, civil engineering, drama and theatre, economics, educational administration, educational communications, educational foundations, educational psychology, electrical engineering, elementary education, English, entomology, food science, French, genetics, geography, geosciences, German, history, horticulture, information sciences, library studies, linguistics, mathematics, mechanical engineering, microbiology, music, nursing, nutrition, ocean engineering, oceanography, Pacific islands studies, pharmacology, philosophy,

physics, physiology, plant pathology, political science, psychology, public health,* secondary education, social work,* sociology, soil science, Spanish, speech-communication, speech pathology and audiology, teaching of English as a second language and zoology.

- (3) The professional certificate for teachers in the employ of the state Department of Education. (See "College of Education.")

Students may likewise earn graduate credit at the University for transfer to other institutions.

To obtain the 1969-70 issue of the Graduate Bulletin, send your order and payment in coin or money order (40c surface mail, \$1.00 air-mail to Canada and the U.S.; to all other countries, 25c plus sufficient postal coupons to cover airmail cost of 6-ounce catalog) to: University Bookstore, 1760 Donaghho Road, University of Hawaii, Honolulu 96822. Available after June 1969.

*For these programs see the Graduate Bulletin or bulletins of the respective schools.

School of Library Studies

THE GRADUATE SCHOOL OF LIBRARY STUDIES exists to prepare professional personnel for academic, public, school and special libraries, and to promote library service in general through research and field study. The School was established in 1965 and was accredited by the American Library Association in 1967.

Academic and placement advising is available in the office of the dean.

Requirements for Admission*

1. Graduation from an approved institution of higher learning with a bachelor's degree representing a broad cultural background plus a field of specialization.

2. Evidence in the college record of above-average scholastic ability and promise for successful graduate study, usually shown by graduation with a *B* average, or by a Graduate Record Examination Aptitude Test score to 500 in both parts of the test.

3. Ability to read at least one modern foreign language.

4. Evidence of professional promise as shown by reference reports and/or personal interviews.

Students may be admitted to the Graduate School of Library Studies as *Regular Students*, *Probational Students*, or *Special Students*, depending on qualifications, background, and purpose.

Requirements for the Degree. 30 to 36 credit hours of approved graduate study, depending upon previous education and library service, are required for the M.L.S. degree. The maximum course load is 15 credit hours per term, and 36 hours would therefore require two terms and a summer on a full-time basis. The program may be undertaken on a part-time schedule with the expectation that it will normally be completed within a two- to three-year period.

*For application forms or for more information write to: The Graduate School of Library Studies, University of Hawaii, Honolulu, Hawaii 96822.

Master of Library Studies Program. The program leading to the degree of Master of Library Studies consists of a core curriculum to provide the basic professional equipment for all types of library work and enough electives to enable each student to explore one area of specialization. The normal basic curriculum includes the following courses, to be taken generally in the order given: 610, 601, 605, 678, 647, 602, 650, 615. School librarians, in addition, will take 681, 682, and 683.

Academic Advisory Service. The office of the dean provides academic advice and placement counseling.

Library Studies (LS)

Professors AYRAULT, DEANGELO, NOLAN, SCHOFIELD, STEVENS, SUZUKI, WEST; Associate Professor HARRIS; Lecturers ADAMS, CROZIER, DANG, FRISTOE, HUNT, KAMIDA, KANE, McALISTER, McNEIL, MYERS, SAITO, TSUI, WHEELWRIGHT

601 Bibliography and Reference Sources (3)

Nolan

Analysis of means by which availability and content of graphic materials recorded; characteristics and problems of national and subject bibliography; function of librarian as bibliographer. Introduction to materials and methods for locating information in general reference sets, specific fact sources, periodical indexes, abstract series; analytical and searching procedures for simple inquiries.

602 Advanced Reference Sources (3)

Nolan, Saito

Continued discussion of various types of general reference tools. Introduction to subject approach in reference work through three major areas: sciences, social sciences, humanities. Each area analyzed in terms of characteristics of literature and of typical problems and methods of reference work; major works in each area studied as examples. Pre: 601.

605 Basic Cataloging and Classification (3)

Ayrault, McAlister, Kamida

Introduction to cataloging in research or large general library, terminal course in cataloging for school or small popular library. Principles and practice of descriptive cataloging, structure, application of Dewey Decimal Classification and Sears' List of Subject Headings; use of printed cards.

606 Advanced Cataloging and Classification (3)

Ayrault

Continue 605, using especially Library of Congress scheme to illustrate principles and practices of organization of materials and subject analysis in research and large general libraries. Considers problems peculiar to handling of certain forms of materials; provides opportunity for study of cataloging in collections specialized by subject. Pre: 605.

610 Social Functions of Libraries (3)

Adams, West

Introduction to librarianship: librarianship as a profession, history of books and libraries, survey of current programs and trends in American libraries, international aspects of librarianship.

615 Building Library Collections (3)

McNeil, Suzuki

Criteria for evaluating and selecting library materials, devising and maintaining acquisition program, structure of book trade. Findings of studies of library use drawn upon where applicable. Pre: 601.

618 Government Documents (3)

Stevens

Sources, types, uses of government documents, both state and federal; their acquisition and organization for use.

642 Audio-Visual Services in Libraries (3)**Schofield**

Films, filmstrips, recordings, related media as applied to various types of educational programs in libraries. Sources, evaluations, organization, use of audio-visual materials. Materials viewed, audited, judged.

647 Management of Library Operations (3)**Myers**

Philosophies and techniques of scientific management, their application to library operations such as circulation, acquisition, cataloging routines. Provides foundation in principal routines in libraries of all types and in theory and practice of scientific management to enable students to analyze routines and, where necessary, to design improved methods for library operations.

650 Administration of Libraries (3)**Fristoe, Hunt, Suzuki**

Organization and human factors for effective library service. Covers governmental relations, policy making, structure of jobs and departments, communication and coordination, staffing, financing, housing. Case studies used.

660 Science and Technology Literature (3)**Crozier**

Bibliographical structure and sources used in building and servicing collections and providing information in basic and applied sciences. Special attention to pure sciences such as physics, chemistry, biology and to applied fields such as medicine, agriculture, engineering.

662 Business and Economic Literature (3)**Wheelwright**

Bibliographic structure and sources used in building and servicing collections and providing information in commercial fields; for students and librarians interested in business and social science services in public, university, company libraries.

665 Special Libraries

Survey of major types of special libraries with emphasis on purpose, organization, physical facilities, collections and services of special libraries in business, government, professional associations.

670 Literature Searching and Documentation (3)

Special intellectual and mechanical tools for storage, searching, reproduction, transmission of information. Deals with audience and materials of documentation. Of particular value to service in special research, large public, university libraries.

678 Reader Services (3)**Harris, Schofield**

Introduction to major forms of library services to the reader as developed in libraries of all types. Emphasis on study of community served as basis for program of reader services. Wide reading, class lectures and discussion, student projects, opportunity to observe services provided in public, school, college, special libraries in the area.

681 Reading Materials for Children (3)**DeAngelo**

Historical background of children's literature; selection aids, criteria for evaluating, evaluation of contemporary children's books and recordings on basis of developmental needs of children through sixth grade. Opportunity to develop skills in storytelling.

682 Reading Materials for Youth (3)**DeAngelo, Schofield**

Evaluation of books and magazines for junior and senior high school age; book selection tools and criteria for judging. Developmental needs of young people with attention to materials for exceptional readers. Methods of stimulating reading such as book lists and book talks.

683 Service for Children and Young People (3)**DeAngelo, Schofield**

Organization and provisions of services from preschool through young adult years, in school and public libraries. Special attention to preparation of lessons in use of books and libraries.

698 Field Seminar (3)

Honors course which may be taken at end of professional program of study. Students in small groups apply all principles learned to analysis of their field experience. Designed to promote understanding of total library programs, and functions and inter-relations of its services. Serves as practice teaching course for school librarians.

701 Administration of Libraries in Asia (3)

Nunn

Governmental and fiscal policies and programs, personnel administration, policy making, buildings and equipment for libraries in Asian countries.

705 Asian Reference Sources (3)

Nunn

Bibliographical and reference tools and services in Asian countries with special attention to source materials in other than Western languages.

706 Technical Services for Far Eastern Collections (3)

Suzuki

Principles and practices of acquiring and organizing Far Eastern Oriental collections. Special attention given to book trade and to special problems of cataloging and classifying Chinese, Japanese, Korean books and materials. Pre: 606, 615 or equivalent.

715 Seminar in Library Development (3)

Each student will prepare report on state of development of library service in a particular country and will outline a program for library development to provide an optimum scheme for library services on all levels in that country. He will submit this plan with budget, personnel requirements, a scheme of feasible priorities for achieving the library program proposed. This will be subjected to class discussion, after which he will submit a revised plan.

Hilo Campus

THE HILO CAMPUS of the University of Hawaii is at present a two-year college, offering courses in the liberal arts and in tropical agriculture, business administration, and engineering. It began in 1947 as a part of the Extension Division of the University and functioned under the College of General Studies. In 1951 it was put under the dean of faculties and two years later it was given a new campus of some 50 acres by the legislature.

The campus commands a view of the Pacific Ocean to the east and of the majestic, snow-capped peak of Mauna Kea (13,796 feet high) to the west. Its extensive grounds on the south side of Hilo, a quiet city of 28,800, provides an ideal location for serious study. The campus now has some eight buildings and three more are under construction. With completion of a new dormitory in 1969, there will be living accommodations for a total of 180 students. Also located on the campus are the facilities of the Cloud Physics Observatory and the East Hawaii Agricultural Station.

Of the 664 students enrolled in courses in the spring of 1968, there were students from the mainland and eleven foreign countries as well as from the island of Hawaii. Located midway between the East and West the Hilo Campus welcomes students of all races and colors with its motto: "Above all nations is humanity."

Objectives

A small liberal arts college cannot offer the variety of courses available at the large university, but its limited size provides opportunities for distinction of another kind. The Hilo Campus endeavors to make the most of these opportunities. As its primary objective, it seeks to create an educational experience that will stimulate its students to become intellectually mature human beings. The intellectually mature person is one who has the background and the willingness to make sound judgments on his own. To ensure such growth, its students pursue a broad background in the cultural heritage of both the West and the East and study contemporary achievements in the arts and sciences. They are required to fulfill a series of general education requirements designed to examine aspects of world civilization, literature, the social sciences and the natural sciences.

Secondly, Hilo Campus strives to equip and encourage its students to experience the thrill of discovering knowledge on their own. Even in the freshman year, it offers tutorial courses of independent research in either the humanities, the social sciences or in natural sciences. In all of the courses it offers it encourages students to play an active part in the process of their own education.

Thirdly, the Hilo Campus strives to stimulate its students to achieve a confidence and an ability to express themselves with ease and effectiveness in written and oral communication. The ideal learned person has always been considered to be one who can write and speak with clarity and conviction. To achieve this ideal, the Hilo Campus expects its students to make oral and written reports and to plan and direct class discussions.

In short, Hilo Campus students are urged to think, to discover, and to communicate with the precision and skill expected of mature persons. A higher value is placed on these skills than on the ability to retain and repeat a bulk of information, which is quickly forgotten.

Library Facilities

The library of the Hilo Campus was built in 1963 and this year an addition is being built that will double its present size. When this is completed, there will be room for 80,000 volumes and seating space for 250 students. At present the library contains over 44,000 volumes and subscribes to over 500 periodicals.

The library is an official depository of federal and state publications. It also contains a special collection in Filipiana, which is particularly strong in materials on Jose Rizal.

Other Buildings on Campus

Besides the library there are some 7 buildings providing classrooms, laboratories, faculty offices, and administrative and athletic facilities. In 1964 a new building, Wentworth Hall, for the physical sciences was added. On campus too are laboratories and offices for the Cloud Physics Observatory and the Agricultural Experiment Station.

Construction will begin this year on a new life science building, a major addition to the library, a faculty office building, a student union and a large dormitory.

Housing

The Hale Kanilehua dormitory provides housing for 28 women and 24 men students. Built in 1962, it has two major wings and a large central lounge. Another dormitory will be completed this year with housing for an additional 130 students.

Applications for dorm space must be accompanied by a \$10 deposit. The cost of a semi-private room is \$155 per semester and is payable at the beginning of each semester. Christmas and Easter recesses are not included in the rental fee. Students are furnished with a bed, pillow, blanket, bedspread, desk, study chair, study lamp, lounge chair and wastebasket. Each student has his own built-in closet, built-in dresser, tackboard, bookshelf and draperies. Meals are provided five days per week in the college cafetorium on a meal contract with the manager. The meal fee is \$12.50 per week.

Off Campus Housing

Additional housing is available off campus in accommodations listed at the office of student services. All possible assistance is offered in locating suitable accommodations.

Applications and correspondence should be directed to:

Office of Student Services
University of Hawaii Hilo Campus
P.O. Box 1357
Hilo, Hawaii 96720

Applications must be received by July 1 for admission in the fall semester and by December 1 for the spring semester.

COURSES OFFERED AT HILO CAMPUS 1969-70

Within each of the three area divisions—Humanities, Sciences, Social Sciences and Education—courses are listed alphabetically by departmental titles in numerical order. Credit hours are shown in parentheses, and also “Lb” when there is laboratory. Two-semester sequences are indicated by hyphenated numbers for both courses and credit hours; unless otherwise noted, such courses should be taken in sequence. Prerequisites, etc., are noted.

Lower division courses are numbered 100-199, upper division courses 200-599.

Class time and room schedules are issued prior to registration for each semester or summer session.

Humanities Division

Professor NELSON; Associate Professors ALLEN (Chairman), BANDER, G. PILECKI; Assistant Professors H. DROSTE, Y. DROSTE, HEARD, L. KANNO, LINDSLEY, MOON, I. PILECKI, TREACY; Instructors BLACK, CREMER, FULLER, HICKS, KARTSOUNIS, KNOX, MILLER, ROBINETTE, YOSHIDA; Lecturers NAKAMOTO, SAIGO

Art 101 Introduction to the Visual Arts (3) I, II

H. Droste, Knox

Survey of visual arts to develop appreciation and evaluation of esthetic form as revealed in painting, sculpture, architecture. Slides, films, readings, discussions, lec-

tures analyze structural features of visual arts and their relationships to the image. Of special value to majors in art, business and economics, architecture, home economics; recommended elective in Arts and Sciences; no prerequisite.

Art 113 Introductory Studio A (3) I, II

H. Droste, Knox

Perception: visual responses to nature; materials, techniques, modes of representation. Problems in two and three dimensions: photography, drawing, painting, sculpture, construction. Pre: 101 (may be taken concurrently).

Art 114 Introductory Studio B (3) I, II

Knox

Emphasis on light: environmental; general intensity; value range; sources; chiaroscuro; pattern; principles of color. Problems in two and three dimensions: drawing, painting, sculpture and design. Pre: 101 and 113.

Art 115 Introductory Studio C (3) I, II

Knox

Emphasis on space: environmental; actual and illusionary; changing spatial systems and space modifiers. Problems in two and three dimensions involving drawing, painting, sculpture, design. Pre: Art 101 (may be taken concurrently).

Art 116 Introductory Studio D (3) I, II

Knox

Emphasis on time, motion, systems; visual kinetics sequence, order and systems. Problems in two and three dimensions involving drawing, painting, sculpture, design. Pre: Art 101 (may be taken concurrently).

Art 213 Figure Drawing(3) I, II

Knox

Intensive drawing from the human figure. May be repeated.

Art 223 Painting A (3) I, II

H. Droste

Painting from studio and outdoor subjects. Elements of pictorial style.

Art 224 Painting B (3) I, II

H. Droste

Painting from identifiable sources; emphasis on expression and structure. Oil and related media. Pre: 223.

Drama 160 Introduction to Drama and Theatre (3)

Representative plays from Classical Greek drama to contemporary theatre, studied as illustrative of changing forms in the theatre and dramatic literature.

Eng 101-102 Expository Writing (3-3) Yr.

101: training in analysis of expository essays; introduction and practice of principal expository procedures, including assertion, exemplification, definition, classification. 102: study and practice of argument and persuasion; assembling and organizing research materials; analysis and evaluation of one or two works of imaginative literature; introduction to study of prose style. 101-102 or 105 prerequisite to all sophomore literature courses.

Eng 105 Expository Writing (3)

Intensive one-semester course in analysis and writing of expository essays, providing practice in different expository procedures, opportunities for students to improve prose style. Open only to freshmen who qualify for course by performance on Freshman English Anticipatory Exam or College Board Advanced Placement Examination in English.

Eng 199 Directed Reading or Research, Lower Division (1-3)

Permission of instructor required.

Eng 251-252 Major Works of British Literature (3-3) Yr.

Nelson, G. Filecki

251: Middle Ages to 1800; 252: 1800 to the present. This course or 253-254 or 255-256 prerequisite to all advanced courses in English.

Eng 253-254 World Literature (3-3) Yr.

Cremer, Y. Droste

Major works of classical, Oriental, European, American literature. 253: Classical times to Renaissance. 254: 1600 to present. May be substituted for 251-252.

Eng 255-256 Types of Literature (3-3) Yr.

Allen, Bander

Practical criticism in major types of European and American literature. 255: short story, novel. 256: drama, poetry. May be substituted for 251-252.

Eng 331 Introduction to Poetry (3)

Written and oral analysis of imagery, sound, language, form and structure of poems, leading to increased awareness of nature of poetry.

Eng (Journalism) 111 Publications Workshop (1)

Moon

Reporting, copy editing, advertising copywriting, proofreading, photography under supervision of publications executives and instructor. May be repeated.

Fr 101-102 Elementary French (4-4) Yr.

I. Pilecki

Conversation, laboratory drill, grammar, reading.

Fr 201-202 Intermediate French (3-3) Yr.

I. Pilecki

Reading, conversation, laboratory drill, composition. Pre: 102 or equivalent.

Ger 101-102 Elementary German (4-4) Yr.

I. Pilecki

Reading, conversation, laboratory drill, grammar.

Ger 201-202 Intermediate German (3-3) Yr.

I. Pilecki

Reading, conversation, laboratory drill, composition. Pre: 102 or equivalent.

IS 190 Film and the Arts (4) (3 L, 1-2 hr Lb) I

Bander, Knox

Investigation into the formal structure of films, including study of character, pace, style, structure, camera use, and theme. Films compared with literature, art music, and other media of expression.

Jap 101-102 Elementary Japanese (3-3) Yr.

Nakamoto, Saigo

Development of listening, speaking, reading, writing. Structural points introduced inductively. Meets 1 hour daily Monday through Friday. 4 out of 5 hours devoted to directed drill and practice. Daily laboratory work.

Jap 201-202 Intermediate Japanese—Reading (4-4) Yr.

Saigo

Continuation of 102. More difficult colloquial texts and additional *kanji*.

Mus 117-118 Introduction to Music Theory (1-1)

Lindsley

Fundamental concepts in musical structure and notation including laboratory experience with vocal and instrumental performance at elementary level. Not open to those who have had 119.

Mus 119 Accelerated Introduction to Music Theory (2)

Lindsley

Content of 117-118 in one semester. Placement conference required. Pre: consent of instructor.

Mus 160 Introduction to Music Literature (3)

Lindsley

Styles and forms of Western music. From listener's point of view. Lab section required.

Mus 102 University Chorus (1)

Lindsley

Performance of choral literature from Renaissance to present. Previous choral experience not required.

Phil 100 Introduction to Philosophy (3)

Moon, Treacy

Problems, methods, fields of philosophy.

Phil 200 History of Philosophy (3) I

Treacy

Western philosophy from era of great Greek thinkers to Renaissance.

Span 101-102 Elementary Spanish (4-4)

Canario

Beginning course, primarily emphasizing oral practice. Laboratory drill.

Span 201-202 Intermediate Spanish (3-3) Yr.

Canario

Continuation of oral practice with increasing emphasis on reading and written composition. Laboratory drill. Pre: 102 or equivalent.

Sp 89

As determined upon placement by entrance examination, intensive individual instruction in conferences and laboratory on sounds, rhythms, idiom, grammar. Pre-requisite to all speech courses.

Sp 101 Speech-Communication Processes (3)

Introduction to study of speech-communication through models of the process. Examination of major variables of source, message, medium, receiver and how their interaction affects speech-communication. Core requirement for majors in speech and education in lieu of Sp 145. Pre: speech-communication proficiency exam.

Sp 145 Expository and Persuasive Speaking (3)

Instruction and practice in analysis and preparation of expository and suasive public discourse.

Speech 145 is prerequisite to all courses bearing a higher number. Every student admitted to 145 is required to present permission from the language laboratory.

Sp 211 General Phonology (3)

Heard

Dynamic phonology of American English. Systematic goal-oriented study of dialects in use. Modification of speech for particular purposes including pedagogy. Pre: ability to transcribe International Phonetic Alphabet according to established standard.

Sciences Division

Associate Professors EMERSON, LITTLE (Chairman), NODA, SOOD; Assistant Professors BALDWIN, DORITY, EDWARDS, LEVENBERG, SMITH; Instructors HWANG, J. KANNO; Lecturers FULLERTON, HUNTER, ITO, LANDGRAF, REIMER

Ag 100 Orientation Course (1)

Itto

Lectures to acquaint student with agriculture in Hawaii and help select major.

Ag 201 Introduction to Forestry (3)

Landgraf

Aims and scope of forestry; economic and social importance of forests; basic resources of forest lands: water, timber, wildlife habitat, recreation and forage; principles and philosophy of sustained multiple-use land management. Pre: Biol 101.

An Sc 141 Animals and Man

Reimer

Study of important domestic animals: origin, distribution, economic importance with introduction to feeding, breeding, management for each species.

Biol 101-102 General Biology (4-4) (3 L, 1 Lb)

Baldwin, Little

Introductory biology course, prerequisite to further courses in biological sciences. Either 101 or 102 may be taken first. Replaces Bot 101 and Zool 101. 101 deals with physiological principles of living organisms. 102 introduces chromosomal phenomena of genetics and reproduction and also acquaints students with representatives of plant and animal kingdoms as well as with evolution.

Chem 110 Scientific Glassworking (1)

Sood

Lab course in techniques of scientific glassworking.

Chem 113-114 General Chemistry (3-3)

Emerson, Sood

Fundamental laws, principles, methods. Desirable preparation for all subsequent courses.

Chem 115-116 General Chemistry Laboratory (1-1)

Emerson, Sood

Pre: credit or registration in 113-114.

Chem 117 General Chemistry (4)

Emerson, Sood

First-year college chemistry. For adequately prepared students who had high school chemistry and currently enrolled in Math 205. Pre: permission of chemistry staff.

Chem 118 General Chemistry Laboratory (2)

Emerson, Sood

For freshmen accepted in accelerated program with 117. Pre: permission of staff.

Chem 133 Elementary Quantitative Analysis (2)

Emerson, Sood

Beginning gravimetric and volumetric analysis. Pre: 117.

Chem 134 Elementary Quantitative Analysis (2) Lab**Emerson, Sood**

Pre: credit or registration in 133.

Chem 243-244 Organic Chemistry (3-3)

Carbon compounds: classification, structure, reactions. Laboratory techniques. Pre: 114 or 117.

Chem 245-246 Organic Chemistry Laboratory (1-1)

Pre: credit or registration in 243-244.

Chem 299 Directed Research (1-3)**Emerson, Sood**

For chemistry majors to familiarize them with basic research techniques, including use of literature. Pre: permission of staff.

CE 211 Surveying I (2)

Basic principles, computations, use of instruments involving horizontal and vertical measurements. Pre: Math 134; GE 101 or GE 109.

CE 212 Surveying II (3) (2 L, 1 Lb)

Topographic mapping; curves; earthwork; computer applications; route problems. Pre: Math 205; CE 211, GE 251.

CE 270 Applied Mechanics I (3)

Equilibrium of particles, rigid bodies, frames and machines; vectors, centroids, friction, moments of inertia. Pre: Math 206; Phys 170.

CE 271 Applied Mechanics II (3)

Dynamics of particles and rigid bodies, impulse-momentum, work-energy. Pre: Math 206; CE 270.

EE 311 Circuit Theory (3)

Analysis of electrical circuits. Transform methods. Topology. Pre: Phys 272; Math 231.

GE 109 Introductory Design and Graphical Analysis (3) (1 L, 2 Lb)

Use of graphical techniques for analysis of engineering problems; design project emphasizing creativity and presentation. Pre: 1 year of high school drawing or GE 61.

GE 251 Digital Computer Programming (1)

Introductory computer programming for applied mathematics and physical science applications.

Ento 161 Entomology (4) (2 L, 2 Lb)**Little**

Structure, habits, biology, classification of insects, insects characteristic of Hawaii.

Gen Sci 121-122 Introduction to Science (4-4) Yr. (3 L, 1 Lb)**Smith**

Characteristics of science and interactions of society with science, illustrated by topics from physical and biological science. Sequence starts in fall semester.

Geosc 101-102 Introduction to Geosciences (4-4) Yr. (3 L, 1 Lb)**Fullerton**

Integrated survey ranging from center of earth to limits of the solar system, emphasizing unifying physical principles.

Hort 262 Principles of Horticulture (3) (2 L, 1 Lb)**Ito**

Relationships of plant structures, nutrients, environment, cultivation methods to plant growth. Pre: Biol 101; credit or concurrent registration in Chem 114.

Math 103 College Algebra (3) I**J. Kanno, Levenberg**

Fundamental operations, functions and graphs, linear equations, systems or linear equations, determinants, quadratic equations, binomial theorem, mathematical induction, inequalities, logarithms.

Math 104 Plane Trigonometry & Analytic Geometry (3) II**J. Kanno, Levenberg**

Periodicity, trigonometric functions, inverse trigonometric functions, elementary identities, analytic geometry of the line and conic sections.

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- Math 111 Introduction to Mathematics (3) I, II** J. Kanno, Levenberg
Study of the structure and concepts of arithmetics.
- Math 134 Pre-Calculus Mathematics (4) I, II** J. Kanno, Levenberg
Basic operations; algebraic functions and equations; trigonometric functions; lines, conics.
- Math 205 Calculus I (4) I, II** J. Kanno, Levenberg
Basic concepts and techniques, derivatives, conics, and integrals.
- Math 206 Calculus II (4) I, II** J. Kanno, Levenberg
Exponential, logarithmic, trigonometric, and hyperbolic functions; techniques of integration; vectors; three dimensional space; multiple integration.
- Math 231 Applied Advanced Calculus I (3) I, II** J. Kanno, Levenberg
Series, partial derivatives, vector spaces.
- Math 232 Ordinary Differential Equations (3) II** J. Kanno, Levenberg
First order equations; linear equations with constant coefficients; systems of equations, Laplace transforms; applications.
- Micro 130 General Bacteriology (3) II** Hunter
Fundamentals of bacteriology with emphasis on microorganisms as they affect people and their possessions. Not open to those who have credit in 351.
- Micro 140 Microbiology Laboratory (1) II** Hunter
Primarily for students in nursing and dental hygiene. Credit or registration in 130; Chem 113-115.
- Phys 160-161 College Physics (4-4) (3 L, 1 Lb)** Emerson
Fundamental principles, theories, experimental methods. Pre: Math 134 or equivalent.
- Phys 170 General Physics (4) I, II** Hwang
Mechanics of particles, rigid bodies; kinetic theory and thermodynamics. Pre: credit or registration in Math 206.
- Phys 171 General Physics Laboratory (1) (1 3-hr. Lb) I, II** Hwang
Experiments in statics, dynamics, properties of matter, periodic motion, sound. Pre: credit or registration in 170.
- Phys 272 General Physics (3) I, II** Hwang
Electricity and magnetism, wave motion, optics. Pre: 170, 171.
- Phys 273 General Physics Laboratory (1) (1 3-hr. Lb) I, II** Hwang
Experiments in optics, electricity, magnetism. Pre: credit or registration in 272.
- Phys 274 General Physics (4) II** Hwang
Relativity, introduction to quantum mechanics, atomic and nuclear physics. Pre: 272, 273 or 160, 161; credit or registration in Math 231.
- Phys 299 Directed Research, Lower Division (1-3) II** Hwang
Pre: 272 and permission of instructor.

Social Sciences and Education Division

Associate Professors MARKEY, SMUCK (Chairman); Assistant Professors BONK, DIXON, FUKUDA, HAMAI, SWANN, USHIJIMA, WARSH; Instructors GOYA, NOWAKI, WHITE, YANAGISAKO

- Anth 150 Introduction to Anthropology (3) I, II** Bonk
General survey. Study of man from biological and cultural viewpoints. Considers relationship of anthropology to other fields, some basic concepts and theoretical approaches, methods of investigating and evaluating subject matter. Investigation

of man as biological animal: physical evolution, development and changes, processes, and present groupings of man. Investigation of archeology: discussion of time, space, cultural change. Cultural patterns and institutions of non-literate and literate societies throughout world provide basis for analysis of culture universals as well as differences.

Anth 151 Introductory Laboratory in Anthropology (1) I, II Bonk
One three hour lab. Pre: registration or credit in 150.

Anth 199 Directed Reading or Research, Lower Division (1-3) I, II Bonk
Permission of instructor required. Pre: 150 or 151, or consent of instructor.

Anth 200 Cultural Anthropology (3)
Nature of cultures; basic concepts for analyzing cultural behavior; patterning, integration, dynamics of culture; culture and individual.

Anth 210 Archeology (3) II Bonk
Introduction to prehistoric archeology methods and techniques of excavation and laboratory analysis; brief survey of man's cultural growth in prehistoric times. Pre: 150 or 200 or written consent of instructor.

Anth 220 Ethnography (3) II Bonk
Comparative study of selected folk, peasant, urban societies of the world. Pre: 150 or 200. (Not offered, 1969-70).

Anth 250 Oceania (3) Bonk
General cultural survey of Pacific area, with emphasis on Polynesia, Micronesia, Melanesia. Origins, pre-history, language, cultural institutions of native peoples; changes taking place in the Pacific. (Not offered, 1969-70.)

AS 301 Civilizations of the East (3) Bonk, White
Physical environment and cultural traditions of East, Southeast, South Asia before Western contact. (Not offered, 1969-70.)

AS 302 Civilizations of the East (3) White
Response of Asian culture to West; movements of nationalism and modernization; Asia's role today. (Not offered, 1969-70.)

Bus 111 Applied Mathematics (3) I, II Swann
Application of mathematical operations to problems in business and economics; linear equations; progressions; theory of sets and functions; elementary matrix notation; differential and integral calculus (partial differentiation, maxima and minima, Lagrange multiplier techniques).

Bus 201-202 Elementary Accounting (3-3) Yr. Swann
Theory and practice of income determination and asset valuation. Preparation and analysis of statements; uses for decision making. Pre: sophomore standing.

Bus 300 Principles of Business Law (3) I, II Swann
American system of jurisprudence, elements of torts, criminal law, property trusts and estates, law of contracts and agency.

Econ 150 Principles of Economics (3) I Swann
Function of economic systems with emphasis on forces determining levels and changes of national income and employment. Describes basic economic institutions, e.g., markets, money, banks, labor organization, corporations.

Econ 151 Principles of Economics (3) II Swann
Analysis of how commodity and factor prices are determined. Policies for efficient allocation of scarce resources.

Econ 300 Intermediate Economic Theory: Price Theory (3)
Price determination and resource allocation under competition, monopoly, oligopoly, monopolistic competition. Theories of demand, cost, partial, general equilibrium.

Econ 304 History of Economic Thought (3)
Survey of economic thought from Adam Smith to present with emphasis on theory of value and distribution.

Econ 340 Money and Banking (3)

Relation of monetary system to price level, employment, income; nature and function of money and banking; role of money in international trade, monetary theories, inflation. Pre: 150.

Geog 101 Elements of Physical Geography (3) I, II

Survey of man's natural environment; distribution and interrelationships of climates, vegetation, soils, landforms. Laboratory problems in map interpretation.

Geog 102 World Regional Geography (3) I, II

Geography of world's major cultural regions; emphasis on geographic aspects of contemporary economic, social, political conditions.

Geog 151 Economic Geography (3) I, II

Systematic study of patterns of economic activities; agriculture, mining, manufacturing, services and consumption. Elements of location theory, transportation, urban geography. Basic aspects of regional economic development and planning.

Geog 375 Cartography (3)

Principles of cartography, including map scales, grid systems, map projection, compilation, symbolism, map reproduction. Laboratory practice with cartographic equipment, techniques of quantitative mapping and terrain presentation.

Geog 421 Urban Geography (3) II

Location, size, functions, spatial-economic structure of modern city. Urban sphere of influence. Problems of urban transportation, changes in land use and urban growth. Role of government in urban development. Pre: 151.

HPE 101 Physical Fitness (1) II

Conditioning exercises, activities to develop and maintain physical efficiency. Motor fitness tests to measure status, progress. Separate sections men and women.

HPE 103 Swimming: Beginning (1) I

Goya

Adjusting to water, immersing in water, floating, sculling; correct arm stroke, leg kick, breathing techniques and their coordination.

HPE 104 Swimming: Intermediate (1) II

Goya

Emphasis on perfecting and integrating basic strokes with added emphasis on swimming for distance and speed.

HPE 107 Tennis: Beginning (1)

Goya, Hamai

Rules, etiquette, grip, forehand and backhand strokes, serving, volleying, singles and doubles play.

HPE 108 Tennis: Advanced (1) II

Hamai

Emphasis on improving the serve, forehand and backhand strokes, volleying, chop strokes, competitive strategy, problems in rules.

HPE 110 Golf: Beginning (1) I, II

Hamai

Rules, etiquette, grip, stance, drive, normal iron shots, approach shots, putting.

HPE 111 Golf: Advanced (1) II

Hamai

Emphasis on improving drive, fairway wood shots, long iron shots, control shots, trouble shots, putting, course management, competitive strategy, problems in rules. Actual play on golf course requires additional fees.

HPE 115 Bowling (1) I, II

Goya

Rules, etiquette, arm swing, approach, execution, scoring, spare pickups. Class participation at bowling alley requires additional fees.

HPE 120 Badminton (1) I, II

Goya

Rules, etiquette, grip, forehand and backhand strokes, serving, smash, drive, net play, offensive and defensive strategy in singles and doubles play.

HPE 126 Rhythmic Activities (1) II

Nowaki

Emphasis on awareness of factors related to enjoyment of social dances including ballroom, mixers, etc.

- HPE 136 Team Sports (1) I, II** Goya
Skills, knowledge, attitudes, appreciation. Combination basketball and soccer. Separate sections men and women.
- HPE 137 Team Sports (1) I, II** Goya
Volleyball & softball. Separate sections for men and women.
- HPE 151 Adapted and Prescribed Exercises (1) I, II** Goya
Small group and individual guidance and instruction for students recommended by Student Health Service.
- HPE 190 Modern Health: Personal (1) I, II** Hamai
Mental-emotional health, family-living, and scientific health information as a basis for personal hygienic living.
- HPE 233 Physical Education: Elementary (3) I, II** Hamai
Content and methods for physical education in elementary school. Emphasis on selection, planning, teaching, evaluation of movement exploration and activities.
- HPE 263 Intramural Athletics (2) I** Hamai
Organization, program, procedures used in conducting sports program for students outside of regular class hours.
- Hist 151-152 World Civilization (3-3) Yr.** Smuck, Warsh, White
Development of civilization from ancient Orient and classical Greece and Rome to present. Devoted primarily to presenting, in broad outline, main cultural and historical development in each area. 1st Sem: 151, ends with Reformation in Europe. 2nd Sem: 152, covers period from 16th century to present. Primary emphasis on Western development.
- Hist 199 Directed Reading or Research (1-3) I, II**
Individual projects in various fields. Limited to majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in history.
- Hist 241-242 Introduction to Asian History (3-3) Yr. I, II** White
Historical survey of major civilizations of Asia from earliest times to present, emphasizing China and India but including Japan, Southeast Asia, and impact of Islam in these areas. (Not offered: 1969-70.)
- Hist 281-282 American History (3-3) Yr.** Warsh
Interpretative survey of U.S. history. 281: 1500 to Civil War; 282: Civil War and Reconstruction period to present.
- Hist 439 Europe in the Nineteenth Century (3)** Smuck
Major political, social, economic, intellectual trends in evolution of Europe from Napoleon to end of World War I.
- Hist 440 Europe Since Versailles (3)** Smuck
Problems of contemporary Europe and their historical background.
- Hist 461 Colonial America to 1790 (3) I** Warsh
Transit of European culture to North America, independence, Constitution. (Not offered 1969-70.)
- Hist 463 Crisis of the Union: U.S. History 1841-1877 (3) I** Warsh
National expansion, sectional conflict; Civil War and Reconstruction.
- Hist 467 Recent America: The U.S. Since 1920 (3) II** Warsh
Triumph of internationalism and the welfare state, a political, economic, cultural and diplomatic survey.
- Hist 484 The South in American History (3) II** Warsh
Southern economic, social, intellectual, political development, with special attention to race relations.
- PolSc 110 Introduction to Political Science (3) I, II** Markey
Examination of major types and practices of government and consideration of modern governments within democratic-autocratic framework.

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- PolSc 210-211 American Government Core (3-3)**
Organization and functioning of American political system.
- PolSc 300-301 Elements of Political Theory (3-3)** Markey
Analysis of works of representative political philosophers.
- Psy 100 Survey of Psychology I, II** Dixon
Principles of human behavior, individual differences, motivation, emotion, perception, learning, etc. Not open to those who have had 111; intended for non-majors.
- Psy 110 Psychology of Adjustment (3)** Dixon
Understanding and improving adjustment. Needs, frustrations, conflicts, anxiety, patterns of adjustment. Concepts of mental health. Not open to majors. (Not offered 1969-70.)
- Psy 112 Introductory Laboratory in Psychology (3) I** Dixon
- Psy 113 Statistical Techniques (3)** Dixon
Frequency distributions; graphic methods, central tendency; variability; correlation; reliability; tests of significance. Pre: two years of high school algebra or equivalent. Pre: 111, 112.
- Psy 199 Directed Reading or Research (1-3) I, II** Dixon
Permission of instructor.
- Psy 214 Learning and Motivation (3)** Dixon
Major conditions influencing learning and forgetting; role of practice, reward, motivation, drive, emotion; theoretical interpretations of learning and motivation. Pre: 111, 112.
- Psy 320 Developmental Psychology (3)** Ushijima
Emotional, mental, physical, social development from infancy to adulthood; interests and abilities at different age levels. Pre: 100 or 111.
- Soc 151 Introduction to the Study of Society (3) I, II** Yanagisako
Basic social relationships, norms, social structures, processes affecting social change. Prerequisite to all advanced courses.
- Soc 199 Directed Reading or Research (1-3) II** Yanagisako
Limited to majors with 2.7 grade-point ratio, or 3.0 grade-point ratio in sociology.
- Soc 310 Community Forces in Hawaii (3) II** Yanagisako
Basic factors and forces in contemporary society as exemplified in Hawaii. (Not offered 1969-70.)
- Soc 360 Personality and Culture (3) I** Yanagisako
Origin and development of personality as subjective aspect of culture; function of communication; human nature and mores; personal life organization.

Community Colleges

A STATEWIDE SYSTEM OF COMMUNITY COLLEGES is administered by the University of Hawaii. Authorized by the state legislature in 1964 and commencing operation in 1965, the community college system is comprised of five public community colleges:

Honolulu Community College, originally established in 1920 as the Territorial Trade School, located at 874 Dillingham Boulevard, Honolulu, Hawaii 96817.

Kapiolani Community College, established in 1957 as Kapiolani Technical School, located at 602 Pensacola Street, Honolulu, Hawaii 96814.

Leeward Oahu Community College, established in 1968, occupying a newly developed campus at 96-050 Farrington Highway, Pearl City, Hawaii 96782.

Maui Community College, established in 1931 as Maui Vocational School, located at 310 Kaahumanu Avenue, Kahului, Maui, Hawaii 96732.

Kauai Community College, established in 1943 as the Kauai Vocational School, occupying a temporary campus at Lihue, Kauai, Hawaii 96766.

The several colleges provide occupational, transfer liberal arts and general education. Admission is granted to all high school graduates and other individuals able to profit from the college offerings. Each institution offers a well developed guidance and counseling program. The associate in arts and the associate in science degrees are granted as are certificates of achievement. Each college has a financial aids program, provisions for student activities, and a student body government. In 1968 the colleges enrolled 5,494 day and 2,269 evening students.

The programs available at the various colleges are listed below. Inquiries should be directed to the registrars of the colleges.

HONOLULU COMMUNITY COLLEGE: Aeronautics Technology, Architectural Drafting Technology, Auto Body Repair and Painting, Automotive Mechanics Technology, Civil Engineering Technology, Commercial Baking, Construction Technology, Cosmetology, Electronics Technology, Electronic-Audio, Radio and Television, Fashion Arts, Fire Science, Food Services, General Education, Industrial Electricity, Metalworking Processes and Technology, Police Science, Refrigeration and Air Conditioning Technology, Sheet Metal Technology, Transfer, Welding Technology.

KAPIOLANI COMMUNITY COLLEGE: Accounting, Commercial Food Service, Data Processing, Dental Assisting, Food Service Mid-Management, General Clerical, General Education, Merchandising and Mid-Management, Practical Nursing, Sales, Secretarial Science, Transfer.

LEEWARD OAHU COMMUNITY COLLEGE : Accounting, Computer Science, General Education, Library Technology, Management, Secretarial Science, Transfer.

KAUAI COMMUNITY COLLEGE: Accounting, Architectural Drafting Technology, Auto Body Repair and Painting, Automotive Mechanics, Carpentry and Cabinet Making, Clerical, General Business, General Education, Secretarial Science, Transfer, Welding.

MAUI COMMUNITY COLLEGE: Accounting, Apparel Design and Construction, Architectural Drafting, Auto Body Repair and Painting, Auto Mechanics, Carpentry Technology, General Education, General Office Training, Industrial Technology, Machine Technology, Secretarial Science, Sheet Metal, Transfer.

East-West Center

THE EAST-WEST CENTER—The Center for Cultural and Technical Interchange between East and West—was established by the U.S. Congress in 1960. The goal of the Center is to further mutual understanding among the peoples of Asia, the Pacific area, and the United States. This goal is the guideline for the programs of intercultural action, research and technical training carried out by the Center in conjunction with regular academic instruction offered by the University. The Center operates through three main divisions, the Institute for Student Interchange, the Institute for Technical Interchange and the Institute of Advanced Projects.

Institute for Student Interchange

Scholarships. Young men and women possessing a high degree of leadership potential and scholastic ability and giving evidence of real interest in the goals of the Center may qualify for scholarships which provide transportation to and from Honolulu, tuition and books, housing in Center residence halls, meals, accident and health insurance, and a monthly incidental allowance. The scholarships may include field education on the mainland United States or in Asia. Scholarships are initially for 17 or 19 months with provisions for extensions for those who qualify.

Scholarships for American and Asia/Pacific students are primarily for graduate study at the University of Hawaii. There are some undergraduate scholarships for those students who come from countries where there are only a limited number of higher educational institutions.

Field Education. Field education provides opportunity to study in Asia or the Pacific islands for those American students in good standing who demonstrate their seriousness, maturity, and ability. Generally, students seeking advanced degrees request up to one semester for research purposes or course work in a university. Certain students whose primary goal is language study may be permitted to spend a longer period overseas in recognized full-time Asian language programs.

The U.S. mainland field education for the student in good standing from Asia or the Pacific provides an opportunity for special study on the mainland United States. This study is usually planned to take place during the summer or fall semester, after two semesters have been spent at the University of Hawaii.

Students on scholarship are expected to participate in intercultural activities as their academic requirements may allow.

Language Requirements. Because the medium of instruction at the University of Hawaii is English, Asian and Pacific student grantees are tested for English proficiency by the University's English Language Institute. Those requiring extra help are assigned to full-time or part-time training in English until they are ready for a full academic program.

American students are required to complete at least two years of Asian language study before the end of their grants.

Intercultural Activities conducted by East-West Center students are designed as a bridge that will enable Asians, Americans and Pacific area students to develop the intercultural understanding recognized as one of the basic functions of the Center. Both groups of students play a vital role in the program by providing sources of information and guidance and by their critical and constructive comparisons of the various Asian/Pacific societies with the variations in culture found in American society.

Institute for Technical Interchange

The Institute for Technical Interchange administers training projects for technical participants from Asia, the Pacific, and the United States. Training, planned on a long and a short term, group or individual basis, is designed to further understanding among nations at the same time technical knowledge is interchanged. Projects may last from 3 to 12 months and subject matter is chosen to fill needs of developing areas. Stress is now being given to training for those Pacific islands which are under the American flag. Current training projects include medical-nursing education for Pacific medical workers; agricultural and economic development in the Pacific and Asia; educational communications; techniques in teaching English to non-English speaking students; and programs designed to develop skills and to improve the status of women in developing areas. The institute also administers training and job observation in Hawaii for Agency for International Development participants and participants from other private or government agencies.

Institute of Advanced Projects

The Institute of Advanced Projects offers a unique program at the advanced professional level. Aimed at improving understanding and establishing better relations between East and West, the institute serves the Center's purpose in two ways: through exchange of persons and exchange and dissemination of information and scholarly materials.

The *Senior Specialists* program brings together distinguished persons

from Asia, the Pacific area, and the United States for informal seminars, research, and writing.

Research Publications and Translations not only translates scholarly materials from and into Asian languages, but also compiles teaching and research aids, such as bilingual dictionaries and annotated bibliographies. Its programs include the *Occasional Papers*, *IAP Reprints*, and *IAP Mimeographs*.

Panels of advisers and consultants on substantive matters have been established to aid in selection of candidates and subject-matter emphases.

Center-wide Programs

In cooperation with the University, the East-West Center is moving gradually toward the problem-oriented approach in programming. This is aimed to coordinate the resources of all three institutes as well as those of the University in interdisciplinary and multicultural research, education and training involving specific problems affecting the quality of life in both East and West. The first to be implemented is the *Population Studies Program* for graduate students at the M.A. and Ph.D. levels in interdisciplinary studies with emphasis on the problems of population growth. Other activities of the Center which support all programs include the East-West Center Library, the East-West Center Press, the Intercultural Activities Office, the Conferences and Seminars Office, the Public Affairs Office, the Community Relations Office and Central Administration.

The *East-West Center Library* is building an outstanding collection of materials, including books, periodicals and microfilm, emphasizing national development and cross-cultural relations. It fosters cooperative Asian library and bibliographic activities to assist in the growth of libraries and librarianship in the developing countries of Asia. The *East-West Center Press* publishes new books originating within the Center as well as from other institutions and individuals throughout the world. It exports American books to Asia and imports Asian books in English.

The *Intercultural Activities Office* participates in programming and coordinates resources of the Center, the University and the larger Hawaii community which contribute to cross-cultural understanding.

The *Conferences and Seminars Office* supports international meetings of senior-level experts dealing with problems of mutual concern to East and West. Center-sponsored conferences are designed primarily to serve as a catalyzing force for planning and executing programs, but the Center also serves as host for other international meetings. The *Public Affairs Office* disseminates information on Center activities, with emphasis on the academic community but also enlisting mass media support. It maintains liaison with former participants in Center programs

through alumni organizations and individuals who continue their commitment to East-West understanding. The *Community Relations Office* coordinates activities of the Center and its grantees with Hawaii's residents, working with the Friends of the East-West Center (an organization of volunteers).

GENERAL INFORMATION

The East-West Center complex includes Thomas Jefferson Hall, the administration building which houses 50 offices, a food center, conference rooms, and the Gallery; Hale Manoa, men's residence; Hale Kuahine, women's residence; John F. Kennedy Hall, theatre-auditorium; Abraham Lincoln Hall, which houses the Institute of Advanced Projects, the Library and Press. A Japanese garden is adjacent to the administration building and a traditionally-styled Thai pavilion, dedicated by King Bhumibol Adulyadej in 1967, lies between Jefferson and Lincoln halls.

The East-West Center, through a grant-in-aid agreement which channels federal funds to the University, is responsible to the Board of Regents through the President of the University. The National Review Board, headed by the Governor of Hawaii, represents the national interest in the Center and advises the U.S. Secretary of State.

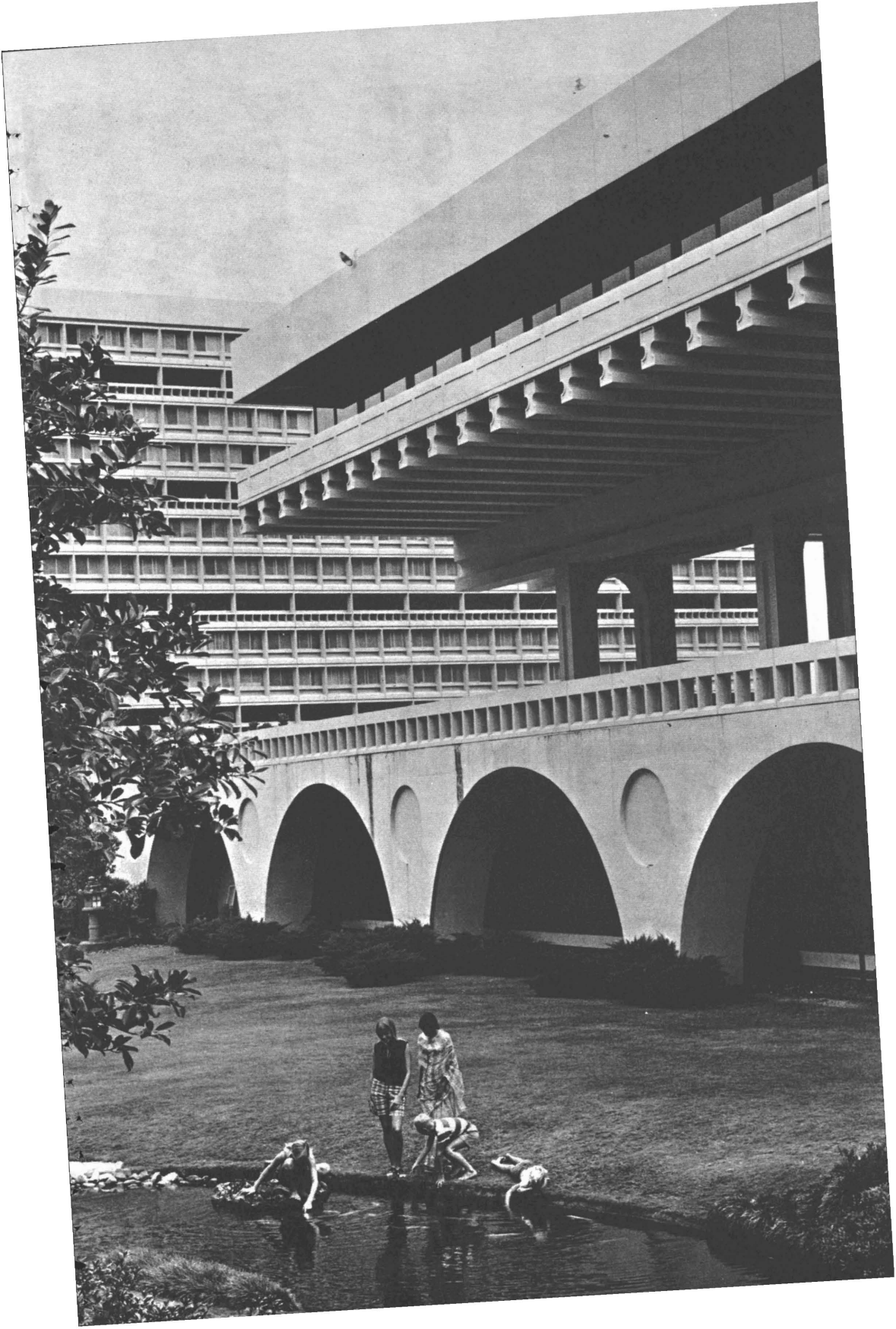
FOR FURTHER INFORMATION

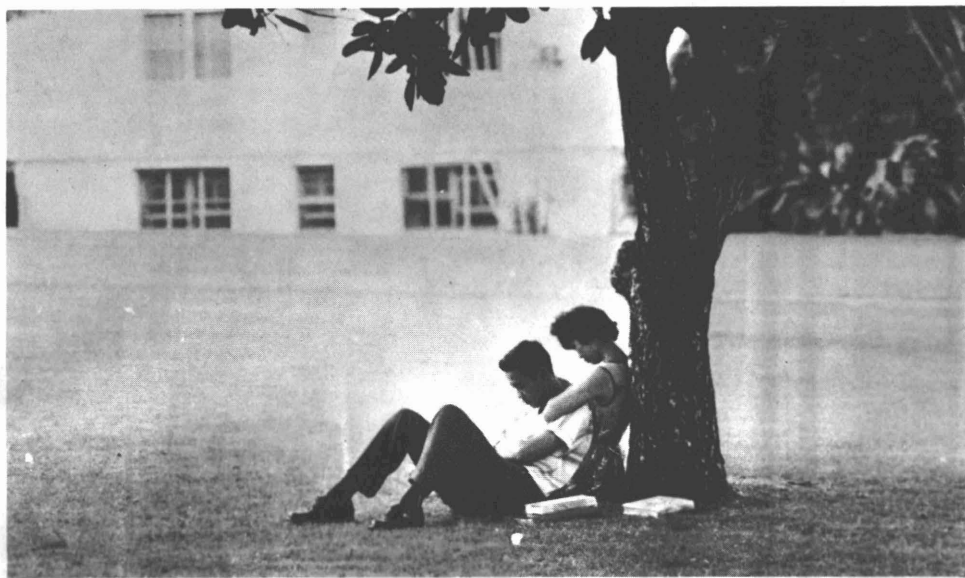
Asian-Pacific Scholarships. Write to the Director of Student Selection, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96822.

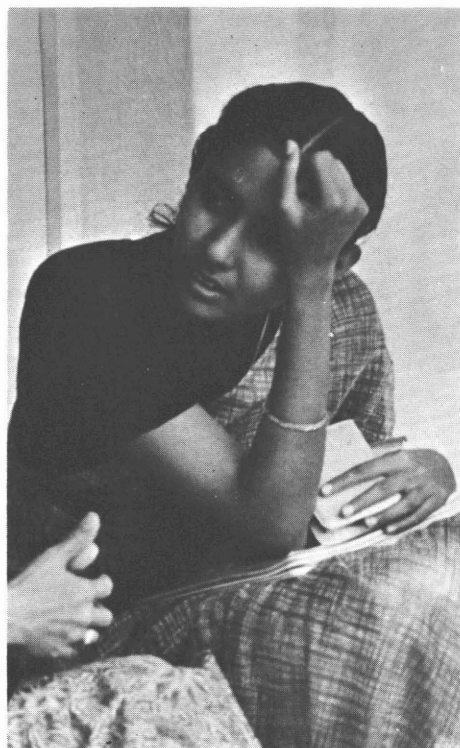
American Scholarships. Write or call on the Director of Student Selection, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96822.

Grants of the Institute of Advanced Projects. Write to the Director, Institute of Advanced Projects, Lincoln Hall, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96822.

Technical Training. Write to the Director, Institute for Technical Interchange, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96822.









Faculty and Staff

BOARD OF REGENTS

TERM EXPIRES

Robert L. Cushing, <i>Chairman, Honolulu</i>	1968
Clarence F. Chang, M.D., <i>Vice-Chairman, Honolulu</i>	1968
Patrick M. Cockett, M.D., <i>Lihue, Kauai</i>	1971
Harold C. Eichelberger, <i>Honolulu</i>	1970
John Farias, Jr., <i>Hilo, Hawaii</i>	1969
Msgr. Charles A. Kekumano, <i>Honolulu</i>	1970
Edward H. Nakamura, <i>Honolulu</i>	1971
Charles S. Ota, <i>Wailuku, Maui</i>	1969
Herbert M. Richards, Jr., <i>Kamuela, Hawaii</i>	1970

ADMINISTRATIVE OFFICERS

General Administration

Harlan Cleveland	<i>President (September 1969—)</i>
A.B. 1938 Princeton; LL.D. 1956 Rollins College, 1960 Franklin and Marshall College, 1962 Middlebury College, 1962 Kent State, 1968 Arizona State; L.H.D. 1958 Alfred, 1966 Kenyon College; D.C.L. 1966 American; Litt.D. 1968 Pittsburgh	
Richard S. Takasaki, B.S., M.A., M.P.A.	<i>Acting President (April 1969—August 1969)</i>
Robert W. Hiatt, B.A., Ph.D.	<i>Acting President (June 1968—April 1969)</i>
Kenneth K. Lau, B.A., J.D., LL.M., <i>Assistant to the President</i>	
Charles B. Neff, B.A., M.A., Ph.D., <i>Academic Assistant to the President</i>	
Roy Y. Takeyama, B.S., M.Ed., LL.B., <i>Special Assistant to the President</i>	
Frederick Y. Smith, B.S., M.S., <i>Director of University Relations and Development</i>	
John W. Shupe, B.S., M.S., Ph.D.	
Robert M. Kamins, B.A., M.A., Ph.D., <i>Dean for Academic Development</i>	
Robert E. Potter, A.B., M.Ed., Ed.D., <i>Associate Dean for Academic Development</i>	
Charles S. James, B.A.,	
Richard H. Kosaki, B.A., M.A., Ph.D.	
Richard L. Balch, A.B.	
<i>Community Service</i>	
James J.M. Misajon, A.B., <i>Administrative Director</i>	
Harold M. Bitner, B.S., M.A., Ph.D.,	
Willard Wilson, B.A., M.A., Ph.D., LL.D.	
Shunzo Sakamaki, B.A., M.A., Ph.D.	
Shiro Amloka, B.Ed., M.Ed., Ph.D., <i>Associate Dean of Summer Session</i>	
Takeshi Moriwaki, B.A., M.A., Ph.D., <i>Assistant Dean of Summer Session</i>	
Kaoru Noda, B.A., M.S., Ph.D.	
Stanley West, A.B., LL.B., B.S.L.S., J.D.	

East-West Center

Everett Kleinjans, B.A., M.A., Ph.D. *Chancellor of the East-West Center*
 John A. Brownell, B.A., M.A., Ph.D., *Deputy Chancellor for Academic Affairs*
 Sam P. Gilstrap, B.S., LL.B., *Deputy Chancellor for Administration*
 Y. Baron Goto, B.A., Sc.D., *Vice-Chancellor, Institute for Technical Interchange*
 Minoru Shinoda, B.A., Ph.D., *Director, Institute for Advanced Projects*
 Herbert D. Long, B.A., B.D., Th.D., *Director, Institute for Student Interchange*

College Administration

David E. Contois, B.A., M.S., Ph.D. *Acting Dean, College of Arts and Sciences*
 Alfred J. Levy, B.A., M.A., Ph.D., *Associate Dean*
 Roger L. Hadlich, B.A., M.A., Ph.D., *Assistant Dean*
 Edwin A. Penn, B.S., M.A., Ed.D., *Assistant Dean*
 Ralph C. Hook, Jr., B.A., M.A., Ph.D. *Dean, College of Business Administration*
 David Beas, B.S., M.B.A., Ph.D., *Assistant Dean*
 Kenneth West, B.S., *Executive Director, Advanced Management Program and Assistant to the Dean*
 Ruth Brownell, B.A., M.A., *Director, Small Business Management Program*
 Edward M. Barnet, S.B., M.B.A., Ph.D. *Dean, School of Travel Industry Management*
 Chuck Gee, A.A., B.S., B.A., M.A., *Associate Dean*
 Hubert V. Everly, B.Ed., M.Ed., Ph.D. *Dean, College of Education*
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 Andrew W.S. In, B.Ed., M.A., Ph.D., *Assistant Dean*
 Paul C. Yuen, B.S., M.S., Ph.D. *Acting Dean, College of Engineering*
 Howard P. Harrenstien, B.S., M.S., Ph.D., *Associate Dean*
 Nicholas B. Corba, B.S., M.Ed., *Assistant Dean*
 Windsor C. Cutting, B.A., M.D. *Dean, School of Medicine*
 N. L. Gault, Jr., B.A., M.B., M.D., *Associate Dean*
 Robert W. Noyes, A.B., M.D., *Associate Dean*
 Terence A. Rogers, B.S., Ph.D., *Associate Dean*
 Edith Anderson, B.S., M.A., Ph.D. *Dean, School of Nursing*
 Yukie T. Gross, B.A., M.N., M.S., *Associate Dean*
 Eleanor A. Judd, B.A., *Administrative Assistant to the Dean*
 Richard K. C. Lee, M.D., Dr.P.H. *Dean, School of Public Health*
 Robert E. Mytinger, B.S., M.P.H., Dr.P.H., *Assistant Dean, Administration*
 Herbert H. Aptekar, B.S., M.S.W., D.S.W. *Dean, School of Social Work*
 C. Peairs Wilson, B.S., M.S., Ph.D. *Dean, College of Tropical Agriculture;*
Director, Hawaii Agricultural Experiment Station and Cooperative Extension Service
 G. Donald Sherman, B.S., M.S., Ph.D., *Associate Director, Hawaii Agricultural Experiment Station and Cooperative Extension Service*
 Dale Goodell, B.S., M.S., *Associate Director, Cooperative Extension Service*
 Shosuke Goto, B.S., M.S., Ph.D., *Assistant Dean, Tropical Agriculture*
 Hazel V. Kraemer, A.B., M.A., Ph.D., *Assistant Dean, Human Resources Development*
 Wytze Gorter, A.A., A.B., Ph.D. *Dean, Graduate Division and Director of Research*
 Howard P. McKaughan, B.A., M.Th., M.A., Ph.D., *Associate Dean, Programs and Personnel*
 Morton M. Rosenberg, B.S., M.S., Ph.D., *Associate Dean, Research Fellowships and Special Training Programs*
 Sumie F. McCabe, B.Ed., M.A., *Assistant Dean, Student Services*
 Ralph M. Miwa, B.A., M.A., Ph.D. *Administrative Dean, Continuing Education*
 Dewey H. Kim, B.A., M.P.A., *Associate Dean*
 Jeffrey A. Fleece, B.A., M.A., Ph.D., *Assistant Dean*
 Robert Stevens, A.B., B.S., M.A. *Dean, School of Library Studies*

DIRECTORS OF SPECIAL UNITS

Donald R. Fukuda, B.S., M.Ed.	Admissions and Records
Guy R. Kirkendall, B.A., M.A.	Asia Training Center
Charles S. James, B.A.	Auxiliary Services
Spencer W. Tinker, B.S., M.S.	Waikiki Aquarium
Yoneo Sagawa, B.A., M.A., Ph.D.	H.L. Lyon Arboretum
C. Peairs Wilson, B.S., M.S., Ph.D.	Cooperative Extension Service
Dale N. Goodell, B.S., M.S.	Associate Director
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David G. Ryans, B.A., A.M., Ph.D.	Education Research and Development Center
Robert M. Reed, B.A., M.A.	Educational Television Broadcasting Service
Tom Dinell, B.A., M.P.A.	Education for Planning Project
Howard P. Harrenstien, B.S., M.S., Ph.D.	Center for Engineering Research
Philip W. Koehler, B.A.	Facilities Management
Robert C. Goodridge, B.A., M.Ed., Ed.D.	Financial Aids
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G. Donald Sherman, B.S., M.S., Ph.D.	Associate Director
Arthur R. King, Jr., B.A., M.A., Ed.D.	Hawaii Curriculum Center
George P. Woollard, B.S., M.S., A.M., Ph.D.	Hawaii Institute of Geophysics
Vernon E. Brock, A.B., M.A.	Hawaii Institute of Marine Biology
Friedrich Seifert, Th.D.	Honors Programs and Selected Studies (Acting)
Harold S. Roberts, B.S.S., M.A., Ph.D.	Industrial Relations Center
John T. Jefferies, B.S., D.S., M.A.	Institute for Astronomy
William G. Savard, B.A., M.A., D.Ed.	Institutional Research Office
R. J. McBeath, B.A., M.S., Ph.D.	Instructional Resources Service Center
A. Lee Zeigler, B.A., M.S.	International Student Office
Harold L. Baker, B.S., M.S., Ph.D.	Land Study Bureau
Herman S. Doi, A.B., LL.B.	Legislative Reference Bureau
John T. O'Brien, B.S.	Look Laboratory of Oceanographic Engineering
John M. Allison, B.A., LL.D.	Overseas Career Program
Terence A. Rogers, B.S., Ph.D.	Pacific Biomedical Research Center
Howard P. McKaughan, B.A., M.Th., M.A., Ph.D.	Pacific and Asian Linguistics Institute
Phillip B. Olsen, B.A., M.A.	Peace Corps Training for Hawaii
Newton E. Morton, B.A., M.S., Ph.D.	Population Genetics Laboratory
Thomas N. Arnett, B.S., LL.B., LL.M.	Personnel
Richard S. Alm, B.S., M.A., Ph.D.	Reading Clinic
A. Leonard Diamond, B.A., M.A., Ph.D.	Sensory Sciences Laboratory
Ruth Brownell, B.A., M.A.	Small Business Management Program
William P. Lebra, B.A., M.A., Ph.D.	Social Science Research Institute
Merle Ansberry, B.A., M.A., Ph.D.	Speech and Hearing Clinic
W. Wesley Peterson, B.A., Ph.D.	Statistical and Computing Center (Acting)
Alfred L. Ellingson, B.A., B.S.	Bureau of Student Activities
Donald F. B. Char, M.D.	Student Health Office
James M. Burgoyne, B.S., M.B.A.	Student Housing Office
William M. Adams, B.A., M.S., Ph.D., M.B.A.	Tsunami Research
H. Roy McArdle, B.S., M.B.A.	University Placement and Career Planning
Robert W. Sparks, B.A., M.A.	University Press
Frederick Y. Smith, B.S., M.S.	University Relations and Development
Doak C. Cox, B.S., M.A., Ph.D.	Water Resources Research Center
Jack T. Nagoshi, B.A., M.S.W.	Youth Development Center

FORMER PRESIDENTS

John W. Gilmore, 1908–1913 (Deceased); B.S.A. 1898, M.S.A. 1906, Cornell
 John S. Donaghho, 1913–1914 (Acting) (Deceased); A.B. 1889, A.M. 1897, Marietta
 Arthur L. Dean, 1914–1927 (Deceased); B.A. 1900, Harvard; Ph.D. 1902, Yale; LL.D. 1947, Hawaii
 David L. Crawford, 1927–1941; B.A. 1911, LL.D. 1933, Pomona; M.A. 1912, Stanford; LL.D. 1957, Hawaii
 Arthur R. Keller, 1941–1942 (Acting) (Deceased); LL.B. 1907, National University Law School; M.S. 1916, M.I.T.
 Gregg M. Sinclair, 1942–1955; B.A. 1912, LL.B. 1949, Minnesota; M.A. 1919, LL.D. 1954, Columbia; LL.D. 1951, Ohio State; LL.D. 1955, California; H.H.D. 1956, Hawaii; D.LIT. 1960, Keio
 Paul S. Bachman, 1955–1957 (Deceased); B.S. 1922, Ohio State; M.A. 1925, Ph.D. 1927, Washington
 Willard Wilson, 1957–1958 (Acting); B.A. 1929, LL.D. 1961, Occidental College; M.A. 1930, Columbia; Ph.D. 1939, Southern California
 Laurence H. Snyder, 1958–1962; B.S. 1922, Sc.D. 1947, Rutgers; M.S. 1924, Sc.D. 1926, Harvard; Sc.D. 1960, Ohio State; H.H.D. 1962, N. Carolina
 Thomas H. Hamilton, 1963–1968; B.A. 1936, LL.D. 1961, DePauw; M.A. 1940, Ph.D. 1947, Chicago; L.H.D. 1960, Alfred University; LL.D. 1961, Rollins College; LL.D. 1961, Colgate; D.H. 1967, Oakland University (Rochester Michigan); LL.D. 1967, Southern California
 Robert W. Hiatt, 1968–1969 (Acting); B.A. 1936, San Jose State; Ph.D. 1941, California

EMERITI

Copy deadline for this list was March 14, 1969; hence it contains names of individuals who have since retired or acquired emeritus status.

Andrews, Carl B., *Emeritus Professor of Engineering*; B.S. 1908, M.S. 1909, C.E. 1917, Rose Polytechnic Institute; M.S. 1928, M.I.T.
 Bennett, J. Gardner, *Emeritus Professor of Engineering*; B.S. 1912, Cornell College; B.S. in C.E. 1918, C.E. 1925, Wisconsin
 Bentley, Lucie F., *Emeritus Associate Professor of Speech, Drama and Theatre*; B.A. 1928, Stanford; M.A. 1933, Cornell
 Bice, Charles M., *Emeritus Senior Specialist in Poultry Husbandry*; B.S. 1927, Wisconsin
 Bilger, Leonora N. (Mrs. Earl M.) *Emeritus Senior Professor of Chemistry*; B.A. 1913, M.A. 1914, Ph.D. 1916, LL.D. 1950, Cincinnati
 Boatman, Elsie M. (Mrs.) *Emeritus Professor of Home Economics*; B.S. 1924, M.S. 1931, Iowa State
 Brown, Hubert E., *Emeritus Professor of Health and Physical Education*; B.P.E. 1920, M.P.E. 1927, Springfield College; Ph.D. 1940, New York
 Carr, Elizabeth B. (Mrs.), *Emeritus Professor of Speech*; B.A. 1924, M.A. 1940, Oklahoma; Ph.D. 1953, Louisiana State
 Carter, Walter, *Emeritus Professor of Entomology*; B.S. 1923, Montana; M.S. 1924, Ph.D. 1928, Minnesota
 Charlot, Jean, *Emeritus Senior Professor of Art*; D.F.A. 1946, Grinnell; LL.D. 1956, St. Mary's College
 Clark, Francis E., *Emeritus Professor of Education*; B.S. 1930, Northern State Teachers College; M.S. 1937, Ed.D. 1948, Colorado
 Clements, Harry F., *Emeritus Senior Professor of Plant Physiology*; B.S. 1924, M.S. 1925, Wisconsin; Ph.D. 1929, Chicago
 Clopton, Robert W., *Emeritus Senior Professor of Education*; B.A. 1926, Maryville College; M.Ed. 1941, Hawaii; Ph.D. 1946, Northwestern
 Ecke, Gustav E. W., *Emeritus Professor of Art*; Ph.D. 1922, Erlangen

- Edmondson, Charles H., *Emeritus Professor of Zoology*; Ph.B. 1903, M.S. 1904, Ph.D. 1906, Iowa
- Eller, Willard E., *Emeritus Professor of Physics*; B.S. 1914, Ph.D. 1928, California; M.S. 1925, Washington
- Emory, Kenneth P., *Emeritus Professor of Anthropology*; B.A. 1920, Dartmouth; M.A. 1923, Harvard; Ph.D. 1946, Yale
- Ewing, Claude H., *Emeritus Professor of Education*; Ph.B. 1933, Chicago; M.A. 1936, Colorado State College; Ph.D. 1946, Northwestern
- George, Dorothy, *Emeritus Professor of English*; B.A. 1936, Louisiana State Normal; M.A. 1937, Ph.D. 1950, Louisiana State
- Gruelle, Katherine B. (Mrs. L. N.), *Emeritus Professor of Home Economics*; B.S. 1917, Ohio State; M.A. 1925, Columbia
- Handley, Katharine N., *Emeritus Dean and Professor of Social Work*; B.A. 1923, Pomona; M.A. 1928, Stanford; M.S.W. 1942, Southern California
- Harloe, Bartley M., *Emeritus Professor of Engineering*; B.S. 1917, U.S. Military Academy; C.E. 1922, Rensselaer
- Henke, Louis A., *Emeritus Professor of Agriculture*; B.S. 1912, M.S. 1923, Wisconsin
- Herrick, Colin J., *Emeritus Professor of Psychology*; B.A. 1924, Haverford College; M.A. 1934, Ph.D. 1939, Pennsylvania
- Holmes, Wilfred J., *Emeritus Dean and Senior Professor of Engineering*; B.S. 1922, U.S. Naval Academy; M.S. 1929, Columbia
- Jones, Virginia A., *Emeritus Dean and Professor of Nursing*; R.N. 1920, Reid Memorial Hospital School of Nursing; B.S. 1933, Indiana; M.Ed. 1944, Hawaii
- Kahananui, Dorothy (Mrs.), *Emeritus Associate Professor of Music*; B.S. 1931, New York; M.Ed. 1936, Hawaii
- Korn, Alfons L., *Emeritus Professor of English*; B.A. 1927, Oregon; B.A. 1930, Oxford; M.A. 1937, California (Berkeley); M.A. 1968, Oxford
- Leebrick, Karl C., *Emeritus Professor of Government*; B.S. 1911, M.S. 1913, Ph.D. 1916, California
- Leong, Yau Sing, *Emeritus Professor of Business Economics and Statistics*; B.A. 1924, Hawaii; M.A. 1925, Ph.D. 1933, Columbia
- Lind, Andrew W., *Emeritus Senior Professor of Sociology*; B.A. 1924, M.A. 1925, Washington; Ph.D. 1931, Chicago
- Livesay, Thayne M., *Emeritus Dean of College of Arts and Sciences*; B.A. 1917, Pacific University; M.A. 1921, Ph.D. 1931, Washington
- Meyer, George A., *Emeritus Professor of Education*; B.S. 1926, Washington State; M.A. 1948, Ph.D. 1950, Washington
- Miller, Carey D., *Emeritus Professor of Nutrition*; B.A. 1917, California; M.S. 1922, Columbia
- Miyake, Iwao, *Emeritus Professor of Physics*; B.S. 1926, M.S. 1929, Hawaii
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- The A&B/Matson Chair in Economics, funded by Alexander & Baldwin Inc. and Matson Navigation Company, Edward S. Shaw* (1969-70).
 The Citizens' Chair in English Literature, funded by the Hawaii State Legislature, Leon Edel* (Spring 1969).
 The Captain James Cook Chair in Oceanography, funded by The Honolulu Advertiser, G. Dietrich* (1969-70).
 The Hawaiian Telephone Company Chair in Science, funded by the Hawaiian Telephone Company, Georg Von Bekey.*
 The Pacific Islands Chair in Anthropology, funded by the Hawaii State Legislature, Douglas L. Oliver.*
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A.B. 1966, Amherst; M.A.T. 1967,
Harvard
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B.A. 1966, M.A. 1968, Hawaii
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Radcliffe
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B.A. 1957, Southwestern Texas; M.A.
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- *Maney, Florence A., *Asst. Professor of
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Claremont
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A.B. 1956, Boston; M.A. 1957, Columbia
- Noda, Lilliann A., *Education Assoc.*
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- Nunes, Shiho, *Assoc. Director and Mgr. of
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- Okimoto, Ray I., *Teacher*
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Peabody
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B.A. 1948, Montana State; M.A. 1958,
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- Wada, Valerie Y., *Education Assoc.*
B.F.A. 1966, Hawaii
- Watanabe, Tokio, *Teacher*
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LIBRARY ACTIVITIES

- Adams, Charles M., *Director, Sinclair
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B.S.L.S. 1933, M.A. 1942, Columbia
- Anderson, Patricia T., Jr., *Library Spec.,
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- Bell, Janet E., *Hawaiian Curator, Hawaiian
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- Chang, Diana M. D., Jr. *Library Spec.,
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- Smith, Margaret H., *Jr. Library Spec., Social Science Reference*; Ed.D. 1936, Hawaii; M.A. 1937, Columbia; B.L.S. 1938, Pratt Institute
- Snipes, Paul D., *Asst. Spec., Instructional Resources Service Center*; B.A. 1949, Transylvania; B.D. 1952, Lexington Theological Seminary; M.S.Ed. 1961, Ed.D. 1968, Indiana
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- Springer, Hisami K., *Jr. Library Spec., General Reference*; B.A. 1964, International Christian University, Tokyo; M.A. 1967, M.L.S. 1968, Hawaii
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- Tsui, Millie, *Acting Head, Processing* A.A. 1947, Bakersfield; B.A. 1954, M.L.S. 1955, California (Berkeley)
- Van Brocklin, Vincent, *Jr. Library Spec., Social Science Reference*; A.B. 1936, Stanford; M.B.A. 1938, Stanford Graduate School of Bus. Ad.; M.L.S. 1967, Hawaii
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- West, Stanley L., *University Librarian and Professor*; A.B. 1933, California (Berkeley); LL.B. 1938, Florida; B.S.L.S. 1942, Columbia; J.D. 1968, Florida
- Yee, Wai-Chee, *Jr. Library Spec., Cataloging* B.A. 1938, Hawaii; B.S.L.S. 1939, Columbia
- Young, Verna H. F., *Jr. Library Spec., Cataloging*; B.A. 1963, Chaminade; M.L.S. 1963, California
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OFFICE OF STUDENT AFFAIRS

- *Bitner, Harold M., *Vice-President for Student Affairs*
- Amjadi, Hormoz, *Specialist (Psychiatrist), Counseling and Testing*; M.D. 1959, Tehran
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- Ellingson, Alfred L., *Director, Student Activities*; B.A. 1943, B.S. 1948, Oregon
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- Lankutis, Katherine, *Asst. in Student Personnel, Gateway*; B.A. 1962, Oberlin
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- McArdle, H. Roy, *Director, Placement and Career Planning*; B.S. 1941, Columbia; M.B.A. 1962, Hawaii
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- Michel, John, *Director, Counseling and Testing*; B.A. 1950, Lehigh; M.A. 1951, Georgia; Ph.D. 1958, Texas
- Morisato, Diane, *Asst. in Student Personnel, Admissions and Records*; B.A. 1968, Hawaii
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- Ohara, Ralph, *Asst. Spec., Admissions and Records*; B.Ed. 1959, M.Ed. 1967, Hawaii
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- Sakamaki, Leigh, *Spec. (Psychiatrist), Counseling and Testing*; B.S. 1955, M.D. 1959, Michigan
- Sherman, Ruth, *Asst. Spec., Counseling and Testing*; B.A. 1942, Douglass, M.A. 1964, Hawaii
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- Sullivan, Carol, *Asst. in Student Personnel, Hale Lahilima*; B.Ed. 1966, M.Ed. 1967, Hawaii
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- Ushijima, Margaret, *Asst. Spec. (Hilo)* B.A. 1949, Illinois Wesleyan; M.S.S. 1952, Smith
- Wagner, Evelyn, *Asst. in Student Personnel, Frear Hall*; A.B. 1944, California (Berkeley)
- Wery, Katherine H., *Asst. Spec., Financial Aids*; B.A. 1944, Westhampton
- Wong, Carolina D., *University Physician* M.D. 1941, Santo Tomas
- Wong, Lawrence Y. W., *University Physician*; B.S. 1951, M.S. 1953, M.D. 1958, Michigan
- Yamasaki, Bette T., Jr., *Spec., Financial Aids*; B.A. 1965, Hawaii; M.A. 1967, Colgate
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RESEARCH UNITS AND FACILITIES

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- *Sagawa, Yoneo, *Director*
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Harvard
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B.S. 1950, Hawaii; M.S. 1952,
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- *Cutting, Windsor C., *Pharmacologist*
- *Friend, Douglas J.C., *Assoc. Botanist*
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California, (Riverside)
- *Goos, Roger D., *Assoc. Botanist*
- *Hamilton, Richard A., *Horticulturist*
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- *Kamemoto, Haruyuki, *Horticulturist*
- *Kefford, Noel P., *Botanist*
- *Krauss, Beatrice, *Plant Physiologist*
- *Matsumoto, Hiromu, *Agricultural*
Biochemist
Nagata, Kenneth, *Asst. in Research*
B.S. 1968, Hawaii
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- *Norton, Ted R., *Pharmacologist*
- *Scheur, Paul J., *Chemist*
- *Smith, Albert C., *Botanist*
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- *Comitini, Salvatore, *Assoc. Economist*
- *Pollack, Richard, *Asst. Economist*
- *Psacharopoulos, George, *Asst. Economist*
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- *Brownell, John A., *Researcher*
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- *Dunn-Rankin, Peter, *Asst. Researcher*
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- *King, Arthur R., Jr., *Researcher*
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- *Beaton, John R., *Nutritionist*
- *Bess, Henry A., *Sr. Entomologist*
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- *Davidson, Jack R., *Agricultural Economist*
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- *Haramoto, Frank H., *Assoc. Entomologist*
- *Hardy, D. Elmo, *Sr. Entomologist*
- *Hartmann, Richard W., *Asst. Horticulturist*
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- *Herrick, Raymond B., *Assoc. Poultry Scientist*
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- *Ikawa, Haruyoshi, *Asst. Soil Scientist*
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- *Mitchell, Wallace C., *Assoc. Entomologist*
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*Hong, Suk Ki, *Professor of Physiology*

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*Moore, Terence O., *Asst. Professor of
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Palumbo, Nicholas E., *Assoc. Veterinarian*
B.S. 1952, DVM 1959, Missouri

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Santo, Leatrice Y., Jr. *Microbiologist*
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Population Genetics Laboratory

Morton, Newton E., *Director*

Hussells, Irene E., *Investigator*

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School of Public Health

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*Degrees listed under "Instruction."

RESEARCH UNITS

- Higuchi, Asa, *Asst. to the Dean, Business Affairs*; B.S. 1949, M.S.W. 1953, Hawaii
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- Hori, Setsuko, *Asst. in Public Health* B.A. 1965, Hawaii
- Irvine, Tahirih A., *Asst. in Public Health* B.A. 1967, Hawaii
- Kada, Jimmy M., *Public Health Administrator*; B.S. 1957, M.P.H. 1965, California (Los Angeles)
- Kimura, Leonard, *Asst. in Public Health* B.B.A. 1964, Hawaii
- Kubota, Sharon, *Asst. in Public Health* B.A. 1968, Hawaii
- Kumasaka, Linda S., *Research Associate* B.A. 1967, Hawaii
- Nagai, Fay Y., Jr. *Researcher* B.S. 1961, Hawaii
- Okubo, Sakiko, Jr. *Researcher* B.Ed. 1933, M.Ed. 1941, Hawaii
- Peiminger, Joyce, *Public Health Coordinator* B.S.N. 1956, Columbia Presbyterian School of Nursing; M.P.H. 1967, Hawaii
- Runck, Dennis W., *Visiting Colleague* B.A. 1959, St. Olaf College; D.D.S. 1965, Minnesota
- *Suehiro, Richard Y., *Assoc. Specialist in Public Health*
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- Terauchi, Mildred M., *Asst. to Dean, Student Affairs*; B.A. 1960, Hawaii; M.P.A. 1961, Syracuse
- Tilton, Floyd H., *Public Health Specialist* A.B., M.A. 1950, California (Los Angeles); M.D.C.W. 1954, McGill; M.P.H. 1963, California (Berkeley)
- Wakashige, Frances K., *Asst. in Public Health*; B.A. 1966, Hawaii
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Social Science Research Institute

- *Lebra, William P., *Director*
- *Babbie, Earl, *Asst. Sociologist*
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- *Pirie, Peter, *Assoc. Geographer*
- *Pitts, Forrest R., *Geographer and Associate Director for Program Development*
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- *Solheim II, Wilhelm G., *Anthropologist*
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- *Clutter, Robert I.
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- *Ekern, Paul C., Jr., *Hydrologist*
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Asia Training Center (UH/AID)

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Cooperative Extension Service

- *Wilson, C. Peairs, *Director*
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OFFICE OF RESEARCH ADMINISTRATION

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McMath, Carroll B., Jr., *Asst. to Director of Research*; B.S. 1932, Oregon State; M.S. 1936, New York

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* Degrees listed under "Instruction."

OFFICE OF VICE-PRESIDENT FOR COMMUNITY COLLEGES

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Ige, Philip K., *Curriculum Coordinator* B.Ed. 1951, M.Ed. 1961, Hawaii; Ph.D. 1968, Columbia

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Shigetomi, Samson S., *State Director for Vocational Education*; B.S. 1962, M.S. 1963, Oklahoma State

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Van Doren, Leon H., *Dean of Instruction*

Key, Paul J., *Dean of Student Services*

Kapiolani Community College

Won, Raymond Y. C., *Provost*

Nakamoto, Harriet H., *Dean of Instruction*

Doi, Edith H., *Dean of Students*

Kauai Community College

Steiger, Walter R., *Provost*

Creamer, James T., *Dean of Instruction*

Kubota, Kiyoshi, *Dean of Administration (on leave)*

Leeward Oahu Community College

Tuthill, Leonard D., *Provost*

Prihoda, John J., *Dean of Educational Services*

Maui Community College

Hoshor, John P., *Provost*

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Sine, Thomas, *Dean of Student Personnel Services*

* Degrees listed under "Instruction."

EAST-WEST CENTER

IAP—Institute of Advanced Projects, ISI—Institute for Student Interchange,
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- Burian, Fredrich J., *Assoc. Program Officer,
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- Dolan, Virginia W., *Sr. Administrative
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- Durham, Marvin L., *Assoc. Institute
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- Gilstrap, Sam P., *Deputy Chancellor for
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- Hata, Samuel T., *Controller, Administration*
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- Kyle, John H., *Director, EWC Press*
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* Degrees listed under "Instruction."

SUMMARY OF ENROLLMENT FOR 1968-69

	1st Sem.	2nd Sem.
Graduate Division		
Doctor's Candidates.....	502	488
Master's Candidates.....	1,927	1,865
	<hr/> 2,429	<hr/> 2,353
College of Arts and Sciences		
Seniors.....	1,081	912
Juniors.....	1,713	1,699
Sophomores.....	2,507	2,542
Freshmen.....	2,711	2,655
	<hr/> 8,012	<hr/> 7,808
College of Business Administration		
Seniors.....	354	335
Juniors.....	406	419
Sophomores.....	335	342
Freshmen.....	297	303
	<hr/> 1,392	<hr/> 1,399
School of Travel Industry Management		
Seniors.....	77	56
Juniors.....	125	130
Sophomores.....	32	82
Freshmen.....	24	68
	<hr/> 258	<hr/> 336
College of Education		
5-Year Diploma.....	174	104
Classified Professional Certificate Candidates.....	41	87
Seniors.....	540	503
Juniors.....	505	519
Sophomores.....	39	42
Freshmen.....	1	2
	<hr/> 1,300	<hr/> 1,257
College of Engineering		
Seniors.....	188	154
Juniors.....	205	219
Sophomores.....	233	226
Freshmen.....	300	275
	<hr/> 926	<hr/> 874
Health Sciences and Social Welfare: Medicine		
Graduate Pre-Clinical Students.....	45	50
Seniors.....	38	33
Juniors.....	33	36
Sophomores.....	0	0
Freshmen.....	0	0
	<hr/> 116	<hr/> 119

Summary of Enrollment (continued)

	1st Sem.	2nd Sem.
Health Sciences and Social Welfare: Nursing		
Seniors.....	64	64
Juniors.....	96	97
Sophomores.....	84	87
Freshmen.....	77	71
	<hr/> 321	<hr/> 319
College of Tropical Agriculture		
Seniors.....	115	102
Juniors.....	158	166
Sophomores.....	124	125
Freshmen.....	74	83
	<hr/> 471	<hr/> 476
Total University Degree and Diploma Candidates ..	15,225	14,941
Not Candidates for University Degrees and Diplomas		
Special Graduate Students.....	79	73
In-Service Teachers.....	57	18
Unclassified Undergraduate Students	703*	521†
Unclassified Graduate Students.....	1,018*	1,111†
	<hr/> 1,857	<hr/> 1,723
Total, Manoa Campus	17,082	16,664
East-West Center Grantees on Study Tours		
Asians.....	27	20
Americans.....	16	10
	<hr/> 43	<hr/> 30
Total, Hilo Campus	679	661
College of General Studies	3,470	3,969
GRAND TOTAL CREDIT STUDENTS	21,274	21,324
	1st Term	2nd Term
Summer Session		
Manoa Campus.....	14,159	5,816
Hilo Campus.....	608	-----
Total	<hr/> 14,767	<hr/> 5,816

*First semester totals include auditors.

†Second semester totals do not include auditors.

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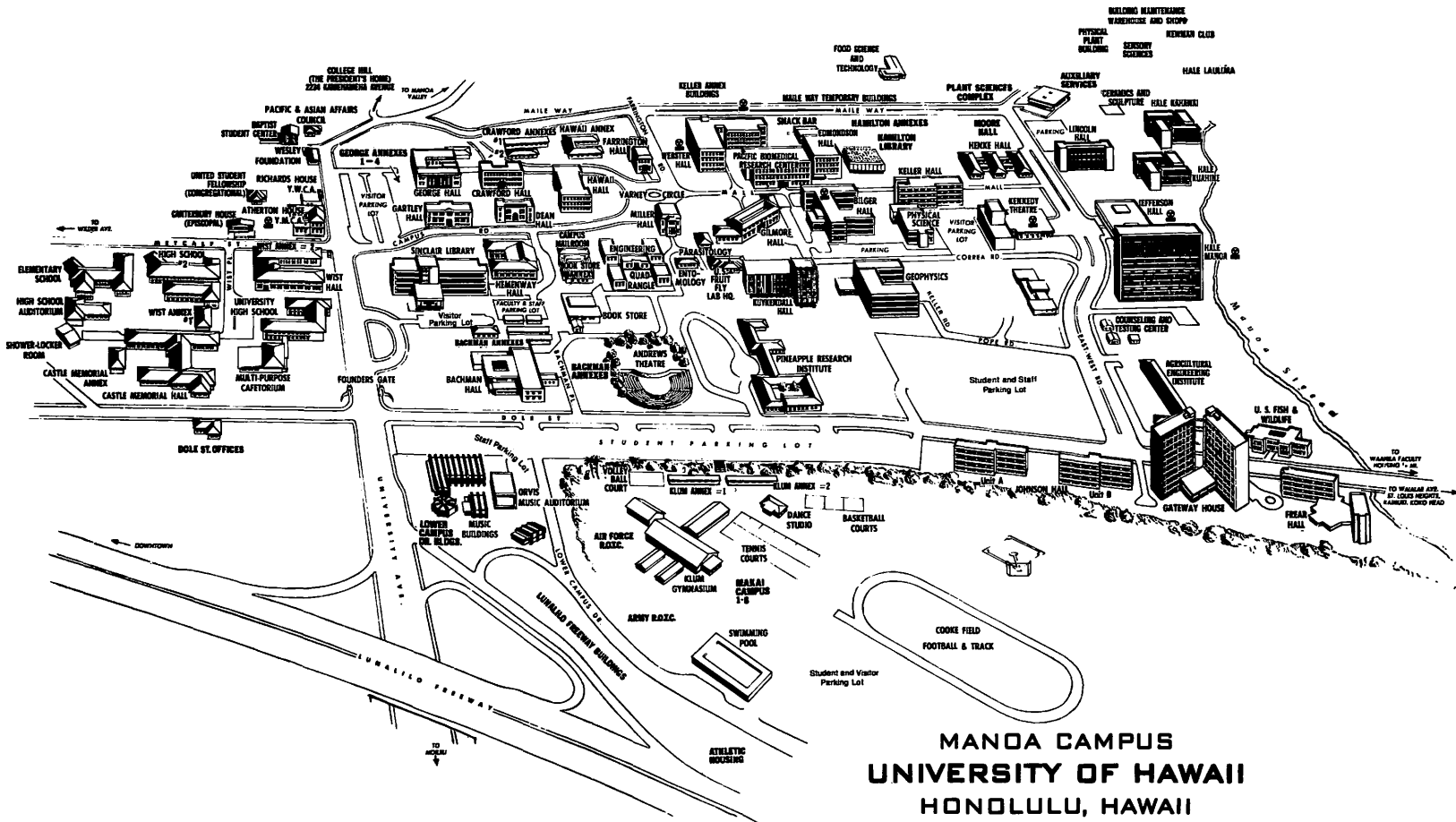
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UNIVERSITY OF HAWAII
Office Locations

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Placement and Career Planning, 1631 Correa Rd.
Selective Service Adviser, Bachman 124
Student Activities Bureau, Hemenway 204
Student Employment, Bachman Annex 2
Student Health Service, 1710 East-West Rd.
Student Housing, Johnson A
Summer Session, PRI 101
Tutoring and Services to Handicapped (*Kokua*) , Bachman Annex 12
U. S. Post Office, Bookstore Annex

